SEQUENCE LISTING

<110> Ling, L.
      Sanicola-Nadel, M.

<120> ANGIOGENESIS-MODULATING COMPOSITIONS AND USES

<130> CIBT-P01-119

<140> 09/883,848
<141> 2001-06-18

<150> 60/211,919
<151> 2000-06-16

<160> 48

<170> PatentIn Ver. 2.1

<210> 1
<211> 1277
<212> DNA
<213> Gallus gallus

<400> 1
atggtcgaaa tgctgctgtt gacaagaatt ctcttggtgg gcttcatctg cgctcttta 60
gtctcctctg ggctgacttg tggaccaggc aggggcattg gaaaaaggag gcaccccaaa 120
aagctgaccc cgttagccta taagcagttt attcccaatg tggcagagaa gaccctaggg 180
gccagtggaa gatatgaagg gaagatcaca agaaactccg agagatttaa agaactaacc 240
ccaaattaca accctgacat tattttttaag gatgaagaga acacgggagc tgacagactg 300
atgactcagc gctgcaagga caagctgaat gccctggcga tctcggtgat gaaccagtgg 360
cccggggtga agctgcgggt gaccgagggc tgggacgagg atggccatca ctccgaggaa 420
tcgctgcact acgagggtcg cgccgtggac atcaccacgt cggatcggga ccgcagcaag 480
tacggaatgc tggcccgcct cgccgtcgag gccggcttcg actgggtcta ctacgagtcc 540
aaggcgcaca tccactgctc cgtcaaagca gaaaactcag tggcagcgaa atcaggaggc 600
tgcttccctg gctcagccac agtgcacctg gagcatggag gcaccaagct ggtgaaggac 660
ctgagccctg gggaccgcgt gctggctgct gacgcggacg gccggctgct ctacagtgac 720
ttcctcacct tcctcgaccg gatggacagc tcccgaaagc tcttctacgt catcgagacg 780
cggcagcccc gggcccggct gctactgacg gcggcccacc tgctctttgt ggcccccag 840
cacaaccagt cggaggccac agggtccacc agtggccagg cgctcttcgc cagcaacgtg 900
aagcctggcc aacgtgtcta tgtgctgggc gagggcgggc agcagctgct gccggcgtct 960
gtccacagcg tctcattgcg ggaggaggcg tccggagcct acgccccact caccgcccag 1020
ggcaccatcc tcatcaaccg ggtgttggcc tcctgctacg ccgtcatcga ggagcacagt 1080
tgggcccatt gggccttcgc accattccgc ttggctcagg gctgctggc cgccctctgc 1140
ccagatgggg ccatccctac tgccgccacc accaccactg gcatccattg gtactcacgg 1200
ctcctctacc gcatcggcag ctgggtgctg gatggtgacg cgctgcatcc gctgggcatg 1260
gtggcaccgg ccagctg 1277

<210> 2
<211> 1190
<212> DNA
<213> Mus musculus

<400> 2
atggctctgc cggccagtct gttgcccctg tgctgcttgg cactcttggc actatctgcc 60
cagagctgcg ggccgggccg aggaccggtt ggccggcggc gttatgtgcg caagcaactt 120

```
gtgcctctgc tatacaagca gtttgtgccc agtatgcccg agcggaccct gggcgcgagt 180
gggccagcgg aggggagggt aacaagggggg tcggagcgct tccgggacct cgtacccaac 240
tacaaccccg acataatctt caaggatgag gagaacagcg gcgcagaccg cctgatgaca 300
gagcgttgca aagagcgggt gaacgctcta gccatcgcgg tgatgaacat gtggcccgga 360
gtacgcctac gtgtgactga aggctgggac gaggacggcc accacgcaca ggattcactc 420
cactacgaag gccgtgcctt ggacatcacc acgtctgacc gtgaccgtaa taagtatggt 480
ttgttggcgc gcctagctgt ggaagccgga ttcgactggg tctactacga gtcccgcaac 540
cacatccacg tatcggtcaa agctgataac tcactggcgg tccgagccgg aggctgcttt 600
ccgggaaatg ccacggtgcg cttgcggagc ggcgaacgga aggggctgag ggaactacat 660
cgtggtgact gggtactggc cgctgatgca gcgggccgag tggtacccac gccagtgctg 720
ctcttcctgg accgggatct gcagcgccgc gcctcgttcg tggctgtgga gaccgagcgg 780
cctccgcgca aactgttgct cacaccctgg catctggtgt tcgctgctcg cgggccagcg 840
cctgctccag gtgactttgc accggtgttc gcgcgccgct tacgtgctgg cgactcggtg 900
ctggctcccg gcggggacgc gctccagccg gcgcgcgtag cccgcgtggc gcgcgaggaa 960
gccgtgggcg tgttcgcacc gctcactgcg cacgggacgc tgctggtcaa cgacgtcctc 1020
gcctcctgct acgcggttct agagagtcac cagtgggccc accgcgcctt cgcccctttg 1080
cggctgctgc acgcgctcgg ggctctgctc cctgggggtg cagtccagcc gactggcatg 1140
cattggtact ctcgcctcct ttaccgcttg gccgaggagt taatgggctg            1190


<210> 3
<211> 1281
<212> DNA
<213> Mus musculus

<400> 3
atgtctcccg cctggctccg gccccgactg cggttctgtc tgttcctgct gctgctgctt 60
ctggtgccgg cggcgcgggg ctgcgggccg ggccgggtgg tgggcagccg ccggaggccg 120
cctcgcaagc tcgtgcctct tgcctacaag cagttcagcc ccaacgtgcc ggagaagacc 180
ctgggcgcca gcgggcgcta cgaaggcaag atcgcgcgca gctctgagcg cttcaaagag 240
ctcaccccca actacaatcc cgacatcatc ttcaaggacg aggagaacac gggtgccgac 300
cgcctcatga cccagcgctg caaggaccgt ctgaactcac tggccatctc tgtcatgaac 360
cagtggcctg gtgtgaaact gcgggtgacc gaaggccggg atgaagatgg ccatcactca 420
gaggagtctt tacactatga gggccgcgcg gtggatatca ccacctcaga ccgtgaccga 480
aataagtatg gactgctggc gcgcttagca gtggaggccg gcttcgactg ggtgtattac 540
gagtccaagg cccacgtgca ttgctctgtc aagtctgagc attcggccgc tgccaagaca 600
ggtggctgct ttcctgccgg agcccaggtg cgcctagaga acggggagcg tgtggccctg 660
tcagctgtaa agccaggaga ccgggtgctg gccatggggg aggatgggac ccccaccttc 720
agtgatgtgc ttattttcct ggaccgcgag ccaaaccggc tgagagcttt ccaggtcatc 780
gagactcagg atcctccgcg tcggctggcg ctcacgcctg cccacctgct cttcattgcg 840
gacaatcata cagaaccagc agcccacttc cgggccacat tgccagcca tgtgcaacca 900
ggccaatatg tgctggtatc aggggtacca ggcctccagc ctgctcgggt ggcagctgtc 960
tccacccacg tggcccttgg gtcctatgct cctctcacaa ggcatgggac acttgtggtg 1020
gaggatgtgg tggcctcctg ctttgcagct gtggctgacc accatctggc tcagttggcc 1080
ttctggcccc tgcgactgtt tcccagtttg gcatgggggca gctggacccc aagtgagggt 1140
gttcactcct accctcagat gctctaccgc ctggggcgtc tcttgctaga agagagcacc 1200
ttccatccac tgggcatgtc tggggcagga agctgaaggg actctaacca ctgccctcct 1260
ggaactgctg tgcgtggatc c                                            1281


<210> 4
<211> 1313
<212> DNA
<213> Mus musculus

<400> 4
atgctgctgc tgctggccag atgttttctg gtgatccttg cttcctcgct gctggtgtgc 60
```

```
cccgggctgg cctgtgggcc cggcagggggg tttggaaaga ggcggcaccc caaaaagctg 120
acccctttag cctacaagca gtttattccc aacgtagccg agaagaccct aggggccagc 180
ggcagatatg aagggaagat cacaagaaac tccgaacgat ttaaggaact cacccccaat 240
tacaaccccg acatcatatt taaggatgag gaaaacacgg gagcagaccg gctgatgact 300
cagaggtgca aagacaagtt aaatgccttg gccatctctg tgatgaacca gtggcctgga 360
gtgaggctgc gagtgaccga gggctgggat gaggacggcc atcattcaga ggagtctcta 420
cactatgagg gtcgagcagt ggacatcacc acgtccgacc gggaccgcag caagtacggc 480
atgctggctc gcctggctgt ggaagcaggt ttcgactggg tctactatga atccaaagct 540
cacatccact gttctgtgaa agcagagaac tccgtggcgg ccaaatccgg cggctgtttc 600
ccgggatccg ccaccgtgca cctggagcag ggcggcacca agctggtgaa ggacttacgt 660
cccggagacc gcgtgctggc ggctgacgac cagggccggc tgctgtacag cgacttcctc 720
accttcctgg accgcgacga aggcgccaag aaggtcttct acgtgatcga gacgctggag 780
ccgcgcgagc gcctgctgct caccgccgcg cacctgctct cgtggcgcc gcacaacgac 840
tcggggccca cgcccgggcc aagcgcgctc tttgccagcc gcgtgcgccc cgggcagcgc 900
gtgtacgtgg tggctgaacg cggcgggggac cgccggctgc tgcccgccgc ggtgcacagc 960
gtgacgctgc gagaggagga ggcgggcgcg tacgcgccgc tcacggcgca cggcaccatt 1020
ctcatcaacc gggtgctcgc ctcgtgctac gctgtcatcg aggagcacag ctgggcacac 1080
cgggccttcg cgcctttccg cctggcgcac gcgctgctgg ccgcgctggc acccgcccgc 1140
acggacggcg ggggcggggg cagcatccct gcagcgcaat ctgcaacgga agcgaggggc 1200
gcggagccga ctgcgggcat ccactggtac tcgcagctgc tctaccacat tggcacctgg 1260
ctgttggaca gcgagaccat gcatcccttg ggaatggcgg tcaagtccag ctg      1313


<210> 5
<211> 1256
<212> DNA
<213> Brachydanio rerio

<400> 5
atgcggcttt tgacgagagt gctgctggtg tctcttctca ctctgtcctt ggtggtgtcc 60
ggactggcct gcggtcctgg cagaggctac ggcagaagaa gacatccgaa gaagctgaca 120
cctctcgcct acaagcagtt catacctaat gtcgcggaga agaccttagg ggccagcggc 180
agatacgagg gcaagataac gcgcaattcg gagagattta aagaacttac tccaaattac 240
aatcccgaca ttatctttaa ggatgaggag aacacgggag cggacaggct catgacacag 300
agatgcaaag acaagctgaa ctcgctggcc atctctgtaa tgaaccactg gccagggggtt 360
aagctgcgtg tgacagaggg ctgggatgag acggtcacc attttgaaga atcactccac 420
tacgagggaa gagctgttga tattaccacc tctgaccgag acaagagcaa atacgggaca 480
ctgtctcgcc tagctgtgga ggctggattt gactgggtct attacgagtc caaagcccac 540
attcattgct ctgtcaaagc agaaaattcg gttgctgcga atctgggggg ctgtttccca 600
ggttcggctc tggtctcgct ccaggacgga ggacagaagg ccgtgaagga cctgaacccc 660
ggagacaagg tgctggcggc agacagcgcg ggaaacctgg tgttcagcga cttcatcatg 720
ttcacagacc gagactccac gacgcgacgt gtgtttacg tcatagaaac gcaagaaccc 780
gttgaaaaga tcaccctcac cgccgctcac ctccttttg tcctcgacaa ctcaacggaa 840
gatctccaca ccatgaccgc cgcgtatgcc agcagtgtca gagccggaca aaaggtgatg 900
gttgttgatg atagcggtca gcttaaatct gtcatcgtgc agcggatata cacggaggag 960
cagcggggct cgttcgcacc agtgactgca catggaccc ttgtggtcga cagaatactg 1020
gcgtcctgtt acgccgtaat agaggaccag gggcttgcgc atttggcctt cgcgcccgcc 1080
aggctctatt attacgtgtc atcattcctg tcccccaaaa ctccagcagt cggtccaatg 1140
cgactttaca acaggagggg gtccactggt actccaggct cctgtcatca aatgggaacg 1200
tggctttggg acagcaacat gcttcatcct ttggggatgt cagtaaactc aagctg      1256


<210> 6
<211> 1425
<212> DNA
<213> Homo sapiens
```

<400> 6

```
atgctgctgc tggcgagatg tctgctgcta gtcctcgtct cctcgctgct ggtatgctcg 60
ggactggcgt gcggaccggg cagggggttc gggaagagga ggcaccccaa aaagctgacc 120
cctttagcct acaagcagtt tatccccaat gtggccgaga agaccctagg cgccagcgga 180
aggtatgaag ggaagatctc cagaaactcc gagcgattta aggaactcac ccccaattac 240
aaccccgaca tcatatttaa ggatgaagaa aacaccggag cggacaggct gatgactcag 300
aggtgtaagg acaagttgaa cgctttggcc atctcggtga tgaaccagtg gccaggagtg 360
aaactgcggg tgaccgaggg ctgggacgaa gatggccacc actcagagga gtctctgcac 420
tacgagggcc gcgcagtgga catcaccacg tctgaccgcg accgcagcaa gtacggcatg 480
ctggcccgcc tggcggtgga ggccggcttc gactgggtgt actacgagtc caaggcacat 540
atccactgct cggtgaaagc agagaactcg gtggcggcca aatcgggagg ctgcttcccg 600
ggctcggcca cggtgcacct ggagcagggc ggcaccaagc tggtgaagga cctgagcccc 660
ggggaccgcg tgctggcggc ggacgaccag ggccggctgc tctacagcga cttcctcact 720
ttcctggacc gcgacgacgg cgccaagaag gtcttctacg tgatcgagac gcgggagccg 780
cgcgagcgcc tgctgctcac cgccgcgcac ctgctctttg tggcgccgca caacgactcg 840
gccaccgggg agcccgaggc gtcctcgggc tcggggccgc cttccggggg cgcactgggg 900
cctcgggcgc tgttcgccag ccgcgtgcgc ccgggccagc gcgtgtacgt ggtggccgag 960
cgtgacgggg accgccggct cctgcccgcc gctgtgcaca gcgtgaccct aagcgaggag 1020
gccgcgggcg cctacgcgcc gctcacggcc cagggcacca ttctcatcaa ccgggtgctg 1080
gcctcgtgct acgcggtcat cgaggagcac agctgggcgc accgggcctt cgcgcccttc 1140
cgcctggcgc acgcgctcct ggctgcactg gcgcccgcgc gcacggaccg cggcggggac 1200
agcggcggcg gggaccgcgg gggcggcggc ggcagagtag ccctaaccgc tccaggtgct 1260
gccgacgctc cgggtgcggg ggccaccgcg ggcatccact ggtactcgca gctgctctac 1320
caaataggca cctggctcct ggacagcgag gccctgcacc cgctgggcat ggcggtcaag 1380
tccagcnnna gccggggggc cggggggggg gcgcgggagg gggcc            1425
```

<210> 7
<211> 1622
<212> DNA
<213> Homo sapiens

<400> 7

```
catcagccca ccaggagacc tcgcccgccg ctcccccggg ctccccggcc atgtctcccg 60
cccggctccg gccccgactg cacttctgcc tggtcctgtt gctgctgctg gtggtgcccg 120
cggcatgggg ctgcgggccg ggtcgggtgg tgggcagccg ccggcgaccg ccacgcaaac 180
tcgtgccgct cgcctacaag cagttcagcc ccaatgtgcc cgagaagacc ctgggcgcca 240
gcggacgcta tgaaggcaag atcgctcgca gctccgagcg cttcaaggag ctcacccca 300
attacaatcc agacatcatc ttcaaggacg aggagaacac aggcgccgac cgcctcatga 360
cccagcgctg caaggaccgc ctgaactcgc tggctatctc ggtgatgaac cagtggcccg 420
gtgtgaagct gcgggtgacc gagggctggg acgaggacgg ccaccactca gaggagtccc 480
tgcattatga gggccgcgcg gtggacatca ccacatcaga ccgcgaccgc aataagtatg 540
gactgctggc gcgcttggca gtggaggccg gctttgactg ggtgtattac gagtcaaagg 600
cccacgtgca ttgctccgtc aagtccgagc actcggccgc agccaagacg ggcggctgct 660
tccctgccgg agcccaggta cgcctggaga gtggggcgcg tgtggccttg tcagccgtga 720
ggccgggaga ccgtgtgctg gccatggggg aggatgggag ccccaccttc agcgatgtgc 780
tcattttcct ggaccgcgag ccccacaggc tgagagcctt ccaggtcatc gagactcagg 840
accccccacg ccgcctggca ctcacacccg ctcacctgct ctttacggct gacaatcaca 900
cggagccggc agcccgcttc cgggccacat ttgccagcca cgtgcagcct ggccagtacg 960
tgctggtggc tggggtgcca ggcctgcagc ctgcccgcgt ggcagctgtc tctacacacg 1020
tggccctcgg ggcctacgcc ccgctcacaa agcatggcac actggtggtg gaggatgtgg 1080
tggcatcctg cttcgcggcc gtggctgacc accacctggc tcagttggcc ttctggcccc 1140
tgagactctt tcacagcttg gcatggggca gctggacccc ggggggaggt gtgcattggt 1200
accccagct gctctaccgc ctggggcgtc tcctgctaga agaggcagc ttccacccac 1260
tgggcatgtc cggggcaggg agctgaaagg actccaccgc tgccctcctg gaactgctgt 1320
actgggtcca gaagcctctc agccaggagg gagctggccc tggaagggac ctgagctggg 1380
ggacactggc tcctgccatc tcctctgcca tgaagataca ccattgagac ttgactgggc 1440
```

```
aacaccagcg tcccccaccc gcgtcgtggt gtagtcatag agctgcaagc tgagctggcg 1500
aggggatggt tgttgacccc tctctcctag agaccttgag gctggcacgg cgactcccaa 1560
ctcagcctgc tctcactacg agttttcata ctctgcctcc cccattggga gggcccattc 1620
cc                                                                 1622


<210> 8
<211> 1191
<212> DNA
<213> Homo sapiens

<400> 8
atggctctcc tgaccaatct actgcccttg tgctgcttgg cacttctggc gctgccagcc 60
cagagctgcg ggccgggccg ggggccggtt ggccggcgcc gctatgcgcg caagcagctc 120
gtgccgctac tctacaagca atttgtgccc ggcgtgccag agcggaccct gggcgccagt 180
gggccagcgg aggggagggt ggcaaggggc tccgagcgct tccgggacct cgtgcccaac 240
tacaaccccg acatcatctt caaggatgag gagaacagtg gagccgaccg cctgatgacc 300
gagcgttgca aggagagggt gaacgctttg gccattgccg tgatgaacat gtggcccgga 360
gtgcgcctac gagtgactga gggctgggac gaggacggcc accacgctca ggattcactc 420
cactacgaag gccgtgcttt ggacatcact acgtctgacc gcgaccgcaa caagtatggg 480
ttgctggcgc gcctcgcagt ggaagccggc ttcgactggg tctactacga gtcccgcaac 540
cacgtccacg tgtcggtcaa agctgataac tcactggcgg tccgggcggg cggctgcttt 600
ccgggaaatg caactgtgcg cctgtggagc ggcgagcgga aagggctgcg ggaactgcac 660
cgcggagact gggttttggc ggccgatgcg tcaggccggg tggtgcccac gccggtgctg 720
ctcttcctgg accgggactt gcagcgccgg gcttcatttg tggctgtgga gaccgagtgg 780
cctccacgca aactgttgct cacgccctgg cacctggtgt ttgccgctcg agggccggcg 840
cccgcgccag gcgactttgc accggtgttc gcgcgccggc tacgcgctgg ggactcggtg 900
ctggcgcccg gcggggatgc gcttcggcca gcgcgcgtgg cccgtgtggc gcgggaggaa 960
gccgtgggcg tgttcgcgcc gctcaccgcg cacgggacgc tgctggtgaa cgatgtcctg 1020
gcctcttgct acgcggttct ggagagtcac cagtgggcgc accgcgcttt tgccccccttg 1080
agactgctgc acgcgctagg ggcgctgctc cccggcgggg ccgtccagcc gactggcatg 1140
cattggtact ctcggctcct ctaccgctta gcggaggagc tactgggctg a         1191


<210> 9
<211> 1251
<212> DNA
<213> Brachydanio rerio

<400> 9
atggacgtaa ggctgcatct gaagcaattt gctttactgt gttttatcag cttgcttctg 60
acgccttgtg gattagcctg tggtcctggt agaggttatg gaaaacgaag acacccaaag 120
aaattaaccc cgttggctta caagcaattc atccccaacg ttgctgagaa aacgcttgga 180
gccagcggca aatacgaagg caaaatcaca aggaattcag agagatttaa agagctgatt 240
ccgaattata atcccgatat catctttaag gacgaggaaa acacaaacgc tgacaggctg 300
atgaccaagc gctgtaagga caagttaaat tcgttggcca tatccgtcat gaaccactgg 360
cccggcgtga aactgcgcgt cactgaaggc tgggatgagg atggtcacca tttagaagaa 420
tctttgcact atgagggacg ggcagtggac atcactacct cagacaggga taaaagcaag 480
tatggatgc tatccaggct tgcagtggag gcaggattcg actgggtcta ttatgaatct 540
aaagcccaca tacactgctc tgtcaaagca gaaaattcag tggctgctaa atcaggagga 600
tgttttcctg ggtctgggac ggtgacactt ggtgatggga cgaggaaacc catcaaagat 660
cttaaagtgg cgaccgggt tttggctgca gacgagaagg gaaatgtctt aataagcgac 720
tttattatgt ttatagacca cgatccgaca acgagaaggc aattcatcgt catcgagacg 780
tcagaacctt tcaccaagct caccctcact gccgcgcacc tagttttcgt tggaaactct 840
tcagcagctt cgggtataac agcaacattt gccagcaacg tgaagcctgg agatacagtt 900
ttagtgtggg aagacacatg cgagagcctc aagagcgtta cagtgaaaag gatttacact 960
gaggagcacg agggctcttt tgcgccagtc accgcgcacg gaaccataat agtggatcag 1020
```

```
gtgttggcat cgtgctacgc ggtcattgag aaccacaaat gggcacattg ggctttgcg  1080
ccggtcaggt tgtgtcacaa gctgatgacg tggcttttc cggctcgtga atcaaacgtc  1140
aatttcagg aggatggtat ccactggtac tcaaatatgc tgtttcacat cggctcttgg  1200
ctgctggaca gagactcttt ccatccactc gggatttttac acttaagttg a         1251


<210> 10
<211> 425
<212> PRT
<213> Gallus gallus

<400> 10
Met Val Glu Met Leu Leu Leu Thr Arg Ile Leu Leu Val Gly Phe Ile
  1               5                  10                  15

Cys Ala Leu Leu Val Ser Ser Gly Leu Thr Cys Gly Pro Gly Arg Gly
              20                  25                  30

Ile Gly Lys Arg Arg His Pro Lys Lys Leu Thr Pro Leu Ala Tyr Lys
          35                  40                  45

Gln Phe Ile Pro Asn Val Ala Glu Lys Thr Leu Gly Ala Ser Gly Arg
      50                  55                  60

Tyr Glu Gly Lys Ile Thr Arg Asn Ser Glu Arg Phe Lys Glu Leu Thr
 65                  70                  75                  80

Pro Asn Tyr Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn Thr Gly
              85                  90                  95

Ala Asp Arg Leu Met Thr Gln Arg Cys Lys Asp Lys Leu Asn Ala Leu
          100                 105                 110

Ala Ile Ser Val Met Asn Gln Trp Pro Gly Val Lys Leu Arg Val Thr
          115                 120                 125

Glu Gly Trp Asp Glu Asp Gly His His Ser Glu Glu Ser Leu His Tyr
      130                 135                 140

Glu Gly Arg Ala Val Asp Ile Thr Thr Ser Asp Arg Asp Arg Ser Lys
145                 150                 155                 160

Tyr Gly Met Leu Ala Arg Leu Ala Val Glu Ala Gly Phe Asp Trp Val
              165                 170                 175

Tyr Tyr Glu Ser Lys Ala His Ile His Cys Ser Val Lys Ala Glu Asn
              180                 185                 190

Ser Val Ala Ala Lys Ser Gly Gly Cys Phe Pro Gly Ser Ala Thr Val
          195                 200                 205

His Leu Glu His Gly Gly Thr Lys Leu Val Lys Asp Leu Ser Pro Gly
      210                 215                 220

Asp Arg Val Leu Ala Ala Asp Ala Asp Gly Arg Leu Leu Tyr Ser Asp
225                 230                 235                 240
```

Phe Leu Thr Phe Leu Asp Arg Met Asp Ser Ser Arg Lys Leu Phe Tyr
                  245   250   255

Val Ile Glu Thr Arg Gln Pro Arg Ala Arg Leu Leu Leu Thr Ala Ala
              260   265   270

His Leu Leu Phe Val Ala Pro Gln His Asn Gln Ser Glu Ala Thr Gly
          275   280   285

Ser Thr Ser Gly Gln Ala Leu Phe Ala Ser Asn Val Lys Pro Gly Gln
    290   295   300

Arg Val Tyr Val Leu Gly Glu Gly Gly Gln Gln Leu Leu Pro Ala Ser
305   310   315   320

Val His Ser Val Ser Leu Arg Glu Glu Ala Ser Gly Ala Tyr Ala Pro
              325   330   335

Leu Thr Ala Gln Gly Thr Ile Leu Ile Asn Arg Val Leu Ala Ser Cys
          340   345   350

Tyr Ala Val Ile Glu Glu His Ser Trp Ala His Trp Ala Phe Ala Pro
          355   360   365

Phe Arg Leu Ala Gln Gly Leu Leu Ala Ala Leu Cys Pro Asp Gly Ala
    370   375   380

Ile Pro Thr Ala Ala Thr Thr Thr Thr Gly Ile His Trp Tyr Ser Arg
385   390   395   400

Leu Leu Tyr Arg Ile Gly Ser Trp Val Leu Asp Gly Asp Ala Leu His
              405   410   415

Pro Leu Gly Met Val Ala Pro Ala Ser
              420   425

<210> 11
<211> 396
<212> PRT
<213> Mus musculus

<400> 11
Met Ala Leu Pro Ala Ser Leu Leu Pro Leu Cys Cys Leu Ala Leu Leu
  1   5   10   15

Ala Leu Ser Ala Gln Ser Cys Gly Pro Gly Arg Gly Pro Val Gly Arg
              20   25   30

Arg Arg Tyr Val Arg Lys Gln Leu Val Pro Leu Leu Tyr Lys Gln Phe
          35   40   45

Val Pro Ser Met Pro Glu Arg Thr Leu Gly Ala Ser Gly Pro Ala Glu
      50   55   60

Gly Arg Val Thr Arg Gly Ser Glu Arg Phe Arg Asp Leu Val Pro Asn
  65   70   75   80

```
Tyr Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn Ser Gly Ala Asp
                85                  90                  95

Arg Leu Met Thr Glu Arg Cys Lys Glu Arg Val Asn Ala Leu Ala Ile
            100             105             110

Ala Val Met Asn Met Trp Pro Gly Val Arg Leu Arg Val Thr Glu Gly
        115             120             125

Trp Asp Glu Asp Gly His His Ala Gln Asp Ser Leu His Tyr Glu Gly
    130             135             140

Arg Ala Leu Asp Ile Thr Thr Ser Asp Arg Asp Arg Asn Lys Tyr Gly
145             150             155             160

Leu Leu Ala Arg Leu Ala Val Glu Ala Gly Phe Asp Trp Val Tyr Tyr
            165             170             175

Glu Ser Arg Asn His Ile His Val Ser Val Lys Ala Asp Asn Ser Leu
        180             185             190

Ala Val Arg Ala Gly Gly Cys Phe Pro Gly Asn Ala Thr Val Arg Leu
        195             200             205

Arg Ser Gly Glu Arg Lys Gly Leu Arg Glu Leu His Arg Gly Asp Trp
    210             215             220

Val Leu Ala Ala Asp Ala Ala Gly Arg Val Val Pro Thr Pro Val Leu
225             230             235             240

Leu Phe Leu Asp Arg Asp Leu Gln Arg Arg Ala Ser Phe Val Ala Val
            245             250             255

Glu Thr Glu Arg Pro Pro Arg Lys Leu Leu Leu Thr Pro Trp His Leu
            260             265             270

Val Phe Ala Ala Arg Gly Pro Ala Pro Ala Pro Gly Asp Phe Ala Pro
        275             280             285

Val Phe Ala Arg Arg Leu Arg Ala Gly Asp Ser Val Leu Ala Pro Gly
        290             295             300

Gly Asp Ala Leu Gln Pro Ala Arg Val Ala Arg Val Ala Arg Glu Glu
305             310             315             320

Ala Val Gly Val Phe Ala Pro Leu Thr Ala His Gly Thr Leu Leu Val
            325             330             335

Asn Asp Val Leu Ala Ser Cys Tyr Ala Val Leu Glu Ser His Gln Trp
        340             345             350

Ala His Arg Ala Phe Ala Pro Leu Arg Leu Leu His Ala Leu Gly Ala
        355             360             365

Leu Leu Pro Gly Gly Ala Val Gln Pro Thr Gly Met His Trp Tyr Ser
    370             375             380
```

Arg Leu Leu Tyr Arg Leu Ala Glu Glu Leu Met Gly
385   390   395

<210> 12
<211> 411
<212> PRT
<213> Mus musculus

<400> 12
Met Ser Pro Ala Trp Leu Arg Pro Arg Leu Arg Phe Cys Leu Phe Leu
  1   5   10   15

Leu Leu Leu Leu Leu Val Pro Ala Ala Arg Gly Cys Gly Pro Gly Arg
            20   25   30

Val Val Gly Ser Arg Arg Arg Pro Pro Arg Lys Leu Val Pro Leu Ala
        35   40   45

Tyr Lys Gln Phe Ser Pro Asn Val Pro Glu Lys Thr Leu Gly Ala Ser
    50   55   60

Gly Arg Tyr Glu Gly Lys Ile Ala Arg Ser Ser Glu Arg Phe Lys Glu
65   70   75   80

Leu Thr Pro Asn Tyr Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn
            85   90   95

Thr Gly Ala Asp Arg Leu Met Thr Gln Arg Cys Lys Asp Arg Leu Asn
            100   105   110

Ser Leu Ala Ile Ser Val Met Asn Gln Trp Pro Gly Val Lys Leu Arg
        115   120   125

Val Thr Glu Gly Arg Asp Glu Asp Gly His His Ser Glu Glu Ser Leu
    130   135   140

His Tyr Glu Gly Arg Ala Val Asp Ile Thr Thr Ser Asp Arg Asp Arg
145   150   155   160

Asn Lys Tyr Gly Leu Leu Ala Arg Leu Ala Val Glu Ala Gly Phe Asp
            165   170   175

Trp Val Tyr Tyr Glu Ser Lys Ala His Val His Cys Ser Val Lys Ser
            180   185   190

Glu His Ser Ala Ala Ala Lys Thr Gly Gly Cys Phe Pro Ala Gly Ala
        195   200   205

Gln Val Arg Leu Glu Asn Gly Glu Arg Val Ala Leu Ser Ala Val Lys
    210   215   220

Pro Gly Asp Arg Val Leu Ala Met Gly Glu Asp Gly Thr Pro Thr Phe
225   230   235   240

```
Ser Asp Val Leu Ile Phe Leu Asp Arg Glu Pro Asn Arg Leu Arg Ala
            245             250             255

Phe Gln Val Ile Glu Thr Gln Asp Pro Pro Arg Arg Leu Ala Leu Thr
            260             265             270

Pro Ala His Leu Leu Phe Ile Ala Asp Asn His Thr Glu Pro Ala Ala
            275             280             285

His Phe Arg Ala Thr Phe Ala Ser His Val Gln Pro Gly Gln Tyr Val
            290             295             300

Leu Val Ser Gly Val Pro Gly Leu Gln Pro Ala Arg Val Ala Ala Val
305             310             315             320

Ser Thr His Val Ala Leu Gly Ser Tyr Ala Pro Leu Thr Arg His Gly
            325             330             335

Thr Leu Val Val Glu Asp Val Val Ala Ser Cys Phe Ala Ala Val Ala
            340             345             350

Asp His His Leu Ala Gln Leu Ala Phe Trp Pro Leu Arg Leu Phe Pro
            355             360             365

Ser Leu Ala Trp Gly Ser Trp Thr Pro Ser Glu Gly Val His Ser Tyr
            370             375             380

Pro Gln Met Leu Tyr Arg Leu Gly Arg Leu Leu Leu Glu Glu Ser Thr
385             390             395             400

Phe His Pro Leu Gly Met Ser Gly Ala Gly Ser
            405             410


<210> 13
<211> 437
<212> PRT
<213> Mus musculus

<400> 13
Met Leu Leu Leu Leu Ala Arg Cys Phe Leu Val Ile Leu Ala Ser Ser
  1             5             10             15

Leu Leu Val Cys Pro Gly Leu Ala Cys Gly Pro Gly Arg Gly Phe Gly
            20             25             30

Lys Arg Arg His Pro Lys Lys Leu Thr Pro Leu Ala Tyr Lys Gln Phe
            35             40             45

Ile Pro Asn Val Ala Glu Lys Thr Leu Gly Ala Ser Gly Arg Tyr Glu
      50             55             60

Gly Lys Ile Thr Arg Asn Ser Glu Arg Phe Lys Glu Leu Thr Pro Asn
65             70             75             80

Tyr Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn Thr Gly Ala Asp
            85             90             95
```

Arg Leu Met Thr Gln Arg Cys Lys Asp Lys Leu Asn Ala Leu Ala Ile
            100   105   110

Ser Val Met Asn Gln Trp Pro Gly Val Arg Leu Arg Val Thr Glu Gly
            115   120   125

Trp Asp Glu Asp Gly His His Ser Glu Glu Ser Leu His Tyr Glu Gly
    130   135   140

Arg Ala Val Asp Ile Thr Thr Ser Asp Arg Asp Arg Ser Lys Tyr Gly
145   150   155   160

Met Leu Ala Arg Leu Ala Val Glu Ala Gly Phe Asp Trp Val Tyr Tyr
            165   170   175

Glu Ser Lys Ala His Ile His Cys Ser Val Lys Ala Glu Asn Ser Val
            180   185   190

Ala Ala Lys Ser Gly Gly Cys Phe Pro Gly Ser Ala Thr Val His Leu
            195   200   205

Glu Gln Gly Gly Thr Lys Leu Val Lys Asp Leu Arg Pro Gly Asp Arg
    210   215   220

Val Leu Ala Ala Asp Asp Gln Gly Arg Leu Leu Tyr Ser Asp Phe Leu
225   230   235   240

Thr Phe Leu Asp Arg Asp Glu Gly Ala Lys Lys Val Phe Tyr Val Ile
            245   250   255

Glu Thr Leu Glu Pro Arg Glu Arg Leu Leu Leu Thr Ala Ala His Leu
            260   265   270

Leu Phe Val Ala Pro His Asn Asp Ser Gly Pro Thr Pro Gly Pro Ser
            275   280   285

Ala Leu Phe Ala Ser Arg Val Arg Pro Gly Gln Arg Val Tyr Val Val
    290   295   300

Ala Glu Arg Gly Gly Asp Arg Arg Leu Leu Pro Ala Ala Val His Ser
305   310   315   320

Val Thr Leu Arg Glu Glu Glu Ala Gly Ala Tyr Ala Pro Leu Thr Ala
            325   330   335

His Gly Thr Ile Leu Ile Asn Arg Val Leu Ala Ser Cys Tyr Ala Val
            340   345   350

Ile Glu Glu His Ser Trp Ala His Arg Ala Phe Ala Pro Phe Arg Leu
            355   360   365

Ala His Ala Leu Leu Ala Ala Leu Ala Pro Ala Arg Thr Asp Gly Gly
    370   375   380

Gly Gly Gly Ser Ile Pro Ala Ala Gln Ser Ala Thr Glu Ala Arg Gly
385   390   395   400

```
Ala Glu Pro Thr Ala Gly Ile His Trp Tyr Ser Gln Leu Leu Tyr His
            405             410             415

Ile Gly Thr Trp Leu Leu Asp Ser Glu Thr Met His Pro Leu Gly Met
            420             425             430

Ala Val Lys Ser Ser
        435


<210> 14
<211> 418
<212> PRT
<213> Brachydanio rerio

<400> 14
Met Arg Leu Leu Thr Arg Val Leu Leu Val Ser Leu Leu Thr Leu Ser
 1               5               10              15

Leu Val Val Ser Gly Leu Ala Cys Gly Pro Gly Arg Gly Tyr Gly Arg
            20              25              30

Arg Arg His Pro Lys Lys Leu Thr Pro Leu Ala Tyr Lys Gln Phe Ile
        35              40              45

Pro Asn Val Ala Glu Lys Thr Leu Gly Ala Ser Gly Arg Tyr Glu Gly
    50              55              60

Lys Ile Thr Arg Asn Ser Glu Arg Phe Lys Glu Leu Thr Pro Asn Tyr
 65              70              75              80

Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn Thr Gly Ala Asp Arg
            85              90              95

Leu Met Thr Gln Arg Cys Lys Asp Lys Leu Asn Ser Leu Ala Ile Ser
            100             105             110

Val Met Asn His Trp Pro Gly Val Lys Leu Arg Val Thr Glu Gly Trp
        115             120             125

Asp Glu Asp Gly His His Phe Glu Glu Ser Leu His Tyr Glu Gly Arg
    130             135             140

Ala Val Asp Ile Thr Thr Ser Asp Arg Asp Lys Ser Lys Tyr Gly Thr
145             150             155             160

Leu Ser Arg Leu Ala Val Glu Ala Gly Phe Asp Trp Val Tyr Tyr Glu
            165             170             175

Ser Lys Ala His Ile His Cys Ser Val Lys Ala Glu Asn Ser Val Ala
        180             185             190

Ala Lys Ser Gly Gly Cys Phe Pro Gly Ser Ala Leu Val Ser Leu Gln
        195             200             205
```

Asp Gly Gly Gln Lys Ala Val Lys Asp Leu Asn Pro Gly Asp Lys Val
        210   215   220

Leu Ala Ala Asp Ser Ala Gly Asn Leu Val Phe Ser Asp Phe Ile Met
225   230   235   240

Phe Thr Asp Arg Asp Ser Thr Thr Arg Arg Val Phe Tyr Val Ile Glu
            245   250   255

Thr Gln Glu Pro Val Glu Lys Ile Thr Leu Thr Ala Ala His Leu Leu
            260   265   270

Phe Val Leu Asp Asn Ser Thr Glu Asp Leu His Thr Met Thr Ala Ala
        275   280   285

Tyr Ala Ser Ser Val Arg Ala Gly Gln Lys Val Met Val Val Asp Asp
    290   295   300

Ser Gly Gln Leu Lys Ser Val Ile Val Gln Arg Ile Tyr Thr Glu Glu
305   310   315   320

Gln Arg Gly Ser Phe Ala Pro Val Thr Ala His Gly Thr Ile Val Val
            325   330   335

Asp Arg Ile Leu Ala Ser Cys Tyr Ala Val Ile Glu Asp Gln Gly Leu
            340   345   350

Ala His Leu Ala Phe Ala Pro Ala Arg Leu Tyr Tyr Tyr Val Ser Ser
        355   360   365

Phe Leu Ser Pro Lys Thr Pro Ala Val Gly Pro Met Arg Leu Tyr Asn
    370   375   380

Arg Arg Gly Ser Thr Gly Thr Pro Gly Ser Cys His Gln Met Gly Thr
385   390   395   400

Trp Leu Leu Asp Ser Asn Met Leu His Pro Leu Gly Met Ser Val Asn
            405   410   415

Ser Ser

<210> 15
<211> 475
<212> PRT
<213> Homo sapiens

<400> 15
Met Leu Leu Leu Ala Arg Cys Leu Leu Val Leu Val Ser Ser Leu
  1   5   10   15

Leu Val Cys Ser Gly Leu Ala Cys Gly Pro Gly Arg Gly Phe Gly Lys
            20   25   30

Arg Arg His Pro Lys Lys Leu Thr Pro Leu Ala Tyr Lys Gln Phe Ile
        35   40   45

```
Pro Asn Val Ala Glu Lys Thr Leu Gly Ala Ser Gly Arg Tyr Glu Gly
    50                  55                  60

Lys Ile Ser Arg Asn Ser Glu Arg Phe Lys Glu Leu Thr Pro Asn Tyr
65                  70                  75                  80

Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn Thr Gly Ala Asp Arg
                85                  90                  95

Leu Met Thr Gln Arg Cys Lys Asp Lys Leu Asn Ala Leu Ala Ile Ser
            100                 105                 110

Val Met Asn Gln Trp Pro Gly Val Lys Leu Arg Val Thr Glu Gly Trp
            115                 120                 125

Asp Glu Asp Gly His His Ser Glu Glu Ser Leu His Tyr Glu Gly Arg
    130                 135                 140

Ala Val Asp Ile Thr Thr Ser Asp Arg Asp Arg Ser Lys Tyr Gly Met
145                 150                 155                 160

Leu Ala Arg Leu Ala Val Glu Ala Gly Phe Asp Trp Val Tyr Tyr Glu
            165                 170                 175

Ser Lys Ala His Ile His Cys Ser Val Lys Ala Glu Asn Ser Val Ala
            180                 185                 190

Ala Lys Ser Gly Gly Cys Phe Pro Gly Ser Ala Thr Val His Leu Glu
            195                 200                 205

Gln Gly Gly Thr Lys Leu Val Lys Asp Leu Ser Pro Gly Asp Arg Val
    210                 215                 220

Leu Ala Ala Asp Asp Gln Gly Arg Leu Leu Tyr Ser Asp Phe Leu Thr
225                 230                 235                 240

Phe Leu Asp Arg Asp Asp Gly Ala Lys Lys Val Phe Tyr Val Ile Glu
            245                 250                 255

Thr Arg Glu Pro Arg Glu Arg Leu Leu Leu Thr Ala Ala His Leu Leu
            260                 265                 270

Phe Val Ala Pro His Asn Asp Ser Ala Thr Gly Glu Pro Glu Ala Ser
            275                 280                 285

Ser Gly Ser Gly Pro Pro Ser Gly Gly Ala Leu Gly Pro Arg Ala Leu
    290                 295                 300

Phe Ala Ser Arg Val Arg Pro Gly Gln Arg Val Tyr Val Val Ala Glu
305                 310                 315                 320

Arg Asp Gly Asp Arg Arg Leu Leu Pro Ala Ala Val His Ser Val Thr
            325                 330                 335

Leu Ser Glu Glu Ala Ala Gly Ala Tyr Ala Pro Leu Thr Ala Gln Gly
    340                 345                 350
```

```
Thr Ile Leu Ile Asn Arg Val Leu Ala Ser Cys Tyr Ala Val Ile Glu
        355                 360             365

Glu His Ser Trp Ala His Arg Ala Phe Ala Pro Phe Arg Leu Ala His
    370             375             380

Ala Leu Leu Ala Ala Leu Ala Pro Ala Arg Thr Asp Arg Gly Gly Asp
385             390             395                 400

Ser Gly Gly Gly Asp Arg Gly Gly Gly Gly Arg Val Ala Leu Thr
            405             410             415

Ala Pro Gly Ala Ala Asp Ala Pro Gly Ala Gly Ala Thr Ala Gly Ile
        420             425             430

His Trp Tyr Ser Gln Leu Leu Tyr Gln Ile Gly Thr Trp Leu Leu Asp
        435             440             445

Ser Glu Ala Leu His Pro Leu Gly Met Ala Val Lys Ser Ser Xaa Ser
    450             455             460

Arg Gly Ala Gly Gly Gly Ala Arg Glu Gly Ala
465             470             475


<210> 16
<211> 411
<212> PRT
<213> Homo sapiens

<400> 16
Met Ser Pro Ala Arg Leu Arg Pro Arg Leu His Phe Cys Leu Val Leu
    1           5               10              15

Leu Leu Leu Leu Val Val Pro Ala Ala Trp Gly Cys Gly Pro Gly Arg
            20              25              30

Val Val Gly Ser Arg Arg Arg Pro Pro Arg Lys Leu Val Pro Leu Ala
            35              40              45

Tyr Lys Gln Phe Ser Pro Asn Val Pro Glu Lys Thr Leu Gly Ala Ser
    50              55              60

Gly Arg Tyr Glu Gly Lys Ile Ala Arg Ser Ser Glu Arg Phe Lys Glu
65              70              75              80

Leu Thr Pro Asn Tyr Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn
            85              90              95

Thr Gly Ala Asp Arg Leu Met Thr Gln Arg Cys Lys Asp Arg Leu Asn
            100             105             110

Ser Leu Ala Ile Ser Val Met Asn Gln Trp Pro Gly Val Lys Leu Arg
        115             120             125
```

```
Val Thr Glu Gly Trp Asp Glu Asp Gly His His Ser Glu Glu Ser Leu
    130             135             140

His Tyr Glu Gly Arg Ala Val Asp Ile Thr Thr Ser Asp Arg Asp Arg
145             150             155             160

Asn Lys Tyr Gly Leu Leu Ala Arg Leu Ala Val Glu Ala Gly Phe Asp
                165             170             175

Trp Val Tyr Tyr Glu Ser Lys Ala His Val His Cys Ser Val Lys Ser
            180             185             190

Glu His Ser Ala Ala Ala Lys Thr Gly Gly Cys Phe Pro Ala Gly Ala
        195             200             205

Gln Val Arg Leu Glu Ser Gly Ala Arg Val Ala Leu Ser Ala Val Arg
    210             215             220

Pro Gly Asp Arg Val Leu Ala Met Gly Glu Asp Gly Ser Pro Thr Phe
225             230             235             240

Ser Asp Val Leu Ile Phe Leu Asp Arg Glu Pro His Arg Leu Arg Ala
            245             250             255

Phe Gln Val Ile Glu Thr Gln Asp Pro Pro Arg Arg Leu Ala Leu Thr
            260             265             270

Pro Ala His Leu Leu Phe Thr Ala Asp Asn His Thr Glu Pro Ala Ala
        275             280             285

Arg Phe Arg Ala Thr Phe Ala Ser His Val Gln Pro Gly Gln Tyr Val
    290             295             300

Leu Val Ala Gly Val Pro Gly Leu Gln Pro Ala Arg Val Ala Ala Val
305             310             315             320

Ser Thr His Val Ala Leu Gly Ala Tyr Ala Pro Leu Thr Lys His Gly
            325             330             335

Thr Leu Val Val Glu Asp Val Val Ala Ser Cys Phe Ala Ala Val Ala
            340             345             350

Asp His His Leu Ala Gln Leu Ala Phe Trp Pro Leu Arg Leu Phe His
        355             360             365

Ser Leu Ala Trp Gly Ser Trp Thr Pro Gly Glu Gly Val His Trp Tyr
    370             375             380

Pro Gln Leu Leu Tyr Arg Leu Gly Arg Leu Leu Leu Glu Glu Gly Ser
385             390             395             400

Phe His Pro Leu Gly Met Ser Gly Ala Gly Ser
            405             410
```

<210> 17
<211> 396
<212> PRT
<213> Homo sapiens

<400> 17
Met Ala Leu Leu Thr Asn Leu Leu Pro Leu Cys Cys Leu Ala Leu Leu
 1   5   10   15

Ala Leu Pro Ala Gln Ser Cys Gly Pro Gly Arg Gly Pro Val Gly Arg
            20   25   30

Arg Arg Tyr Ala Arg Lys Gln Leu Val Pro Leu Leu Tyr Lys Gln Phe
            35   40   45

Val Pro Gly Val Pro Glu Arg Thr Leu Gly Ala Ser Gly Pro Ala Glu
        50   55   60

Gly Arg Val Ala Arg Gly Ser Glu Arg Phe Arg Asp Leu Val Pro Asn
65   70   75   80

Tyr Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn Ser Gly Ala Asp
                85   90   95

Arg Leu Met Thr Glu Arg Cys Lys Glu Arg Val Asn Ala Leu Ala Ile
            100   105   110

Ala Val Met Asn Met Trp Pro Gly Val Arg Leu Arg Val Thr Glu Gly
        115   120   125

Trp Asp Glu Asp Gly His His Ala Gln Asp Ser Leu His Tyr Glu Gly
    130   135   140

Arg Ala Leu Asp Ile Thr Thr Ser Asp Arg Asp Arg Asn Lys Tyr Gly
145   150   155   160

Leu Leu Ala Arg Leu Ala Val Glu Ala Gly Phe Asp Trp Val Tyr Tyr
                165   170   175

Glu Ser Arg Asn His Val His Val Ser Val Lys Ala Asp Asn Ser Leu
            180   185   190

Ala Val Arg Ala Gly Gly Cys Phe Pro Gly Asn Ala Thr Val Arg Leu
            195   200   205

Trp Ser Gly Glu Arg Lys Gly Leu Arg Glu Leu His Arg Gly Asp Trp
    210   215   220

Val Leu Ala Ala Asp Ala Ser Gly Arg Val Val Pro Thr Pro Val Leu
225   230   235   240

Leu Phe Leu Asp Arg Asp Leu Gln Arg Arg Ala Ser Phe Val Ala Val
                245   250   255

Glu Thr Glu Trp Pro Pro Arg Lys Leu Leu Leu Thr Pro Trp His Leu
                260   265   270

```
Val Phe Ala Ala Arg Gly Pro Ala Pro Ala Pro Gly Asp Phe Ala Pro
        275                 280             285

Val Phe Ala Arg Arg Leu Arg Ala Gly Asp Ser Val Leu Ala Pro Gly
        290             295             300

Gly Asp Ala Leu Arg Pro Ala Arg Val Ala Arg Val Ala Arg Glu Glu
305             310             315                 320

Ala Val Gly Val Phe Ala Pro Leu Thr Ala His Gly Thr Leu Leu Val
            325             330                 335

Asn Asp Val Leu Ala Ser Cys Tyr Ala Val Leu Glu Ser His Gln Trp
            340             345             350

Ala His Arg Ala Phe Ala Pro Leu Arg Leu Leu His Ala Leu Gly Ala
        355             360             365

Leu Leu Pro Gly Gly Ala Val Gln Pro Thr Gly Met His Trp Tyr Ser
    370             375             380

Arg Leu Leu Tyr Arg Leu Ala Glu Glu Leu Leu Gly
385             390             395


<210> 18
<211> 416
<212> PRT
<213> Brachydanio rerio

<400> 18
Met Asp Val Arg Leu His Leu Lys Gln Phe Ala Leu Leu Cys Phe Ile
  1             5                 10                  15

Ser Leu Leu Leu Thr Pro Cys Gly Leu Ala Cys Gly Pro Gly Arg Gly
            20              25              30

Tyr Gly Lys Arg Arg His Pro Lys Lys Leu Thr Pro Leu Ala Tyr Lys
        35              40              45

Gln Phe Ile Pro Asn Val Ala Glu Lys Thr Leu Gly Ala Ser Gly Lys
    50              55              60

Tyr Glu Gly Lys Ile Thr Arg Asn Ser Glu Arg Phe Lys Glu Leu Ile
65              70              75                  80

Pro Asn Tyr Asn Pro Asp Ile Ile Phe Lys Asp Glu Glu Asn Thr Asn
            85              90                  95

Ala Asp Arg Leu Met Thr Lys Arg Cys Lys Asp Lys Leu Asn Ser Leu
        100             105             110

Ala Ile Ser Val Met Asn His Trp Pro Gly Val Lys Leu Arg Val Thr
        115             120             125

Glu Gly Trp Asp Glu Asp Gly His His Leu Glu Glu Ser Leu His Tyr
    130             135             140
```

```
Glu Gly Arg Ala Val Asp Ile Thr Thr Ser Asp Arg Asp Lys Ser Lys
145             150             155             160

Tyr Gly Met Leu Ser Arg Leu Ala Val Glu Ala Gly Phe Asp Trp Val
            165             170             175

Tyr Tyr Glu Ser Lys Ala His Ile His Cys Ser Val Lys Ala Glu Asn
        180             185             190

Ser Val Ala Ala Lys Ser Gly Gly Cys Phe Pro Gly Ser Gly Thr Val
        195             200             205

Thr Leu Gly Asp Gly Thr Arg Lys Pro Ile Lys Asp Leu Lys Val Gly
    210             215             220

Asp Arg Val Leu Ala Ala Asp Glu Lys Gly Asn Val Leu Ile Ser Asp
225             230             235             240

Phe Ile Met Phe Ile Asp His Asp Pro Thr Thr Arg Arg Gln Phe Ile
            245             250             255

Val Ile Glu Thr Ser Glu Pro Phe Thr Lys Leu Thr Leu Thr Ala Ala
            260             265             270

His Leu Val Phe Val Gly Asn Ser Ser Ala Ala Ser Gly Ile Thr Ala
        275             280             285

Thr Phe Ala Ser Asn Val Lys Pro Gly Asp Thr Val Leu Val Trp Glu
    290             295             300

Asp Thr Cys Glu Ser Leu Lys Ser Val Thr Val Lys Arg Ile Tyr Thr
305             310             315             320

Glu Glu His Glu Gly Ser Phe Ala Pro Val Thr Ala His Gly Thr Ile
            325             330             335

Ile Val Asp Gln Val Leu Ala Ser Cys Tyr Ala Val Ile Glu Asn His
            340             345             350

Lys Trp Ala His Trp Ala Phe Ala Pro Val Arg Leu Cys His Lys Leu
            355             360             365

Met Thr Trp Leu Phe Pro Ala Arg Glu Ser Asn Val Asn Phe Gln Glu
    370             375             380

Asp Gly Ile His Trp Tyr Ser Asn Met Leu Phe His Ile Gly Ser Trp
385             390             395             400

Leu Leu Asp Arg Asp Ser Phe His Pro Leu Gly Ile Leu His Leu Ser
            405             410             415
```

<210> 19
<211> 1416
<212> DNA
<213> Drosophila melanogaster

<220>
<221> CDS
<222> (1)..(1413)

<400> 19
atg gat aac cac agc tca gtg cct tgg gcc agt gcc gcc agt gtc acc   48
Met Asp Asn His Ser Ser Val Pro Trp Ala Ser Ala Ala Ser Val Thr
 1   5   10   15

tgt ctc tcc ctg gga tgc caa atg cca cag ttc cag ttc cag ttc cag   96
Cys Leu Ser Leu Gly Cys Gln Met Pro Gln Phe Gln Phe Gln Phe Gln
                20   25   30

ctc caa atc cgc agc gag ctc cat ctc cgc aag ccc gca aga aga acg   144
Leu Gln Ile Arg Ser Glu Leu His Leu Arg Lys Pro Ala Arg Arg Thr
            35   40   45

caa acg atg cgc cac att gcg cat acg cag cgt tgc ctc agc agg ctg   192
Gln Thr Met Arg His Ile Ala His Thr Gln Arg Cys Leu Ser Arg Leu
        50   55   60

acc tct ctg gtg gcc ctg ctg ctg atc gtc ttg ccg atg gtc ttt agc   240
Thr Ser Leu Val Ala Leu Leu Leu Ile Val Leu Pro Met Val Phe Ser
 65   70   75   80

ccg gct cac agc tgc ggt cct ggc cga gga ttg ggt cgt cat agg gcg   288
Pro Ala His Ser Cys Gly Pro Gly Arg Gly Leu Gly Arg His Arg Ala
                85   90   95

cgc aac ctg tat ccg ctg gtc ctc aag cag aca att ccc aat cta tcc   336
Arg Asn Leu Tyr Pro Leu Val Leu Lys Gln Thr Ile Pro Asn Leu Ser
                100   105   110

gag tac acg aac agc gcc tcc gga cct ctg gag ggt gtg atc cgt cgg   384
Glu Tyr Thr Asn Ser Ala Ser Gly Pro Leu Glu Gly Val Ile Arg Arg
            115   120   125

gat tcg ccc aaa ttc aag gac ctc gtg ccc aac tac aac agg gac atc   432
Asp Ser Pro Lys Phe Lys Asp Leu Val Pro Asn Tyr Asn Arg Asp Ile
        130   135   140

ctt ttc cgt gac gag gaa ggc acc gga gcg gat ggc ttg atg agc aag   480
Leu Phe Arg Asp Glu Glu Gly Thr Gly Ala Asp Gly Leu Met Ser Lys
145   150   155   160

cgc tgc aag gag aag cta aac gtg ctg gcc tac tcg gtg atg aac gaa   528
Arg Cys Lys Glu Lys Leu Asn Val Leu Ala Tyr Ser Val Met Asn Glu
                165   170   175

tgg ccc ggc atc cgg ctg ctg gtc acc gag agc tgg gac gag gac tac   576
Trp Pro Gly Ile Arg Leu Leu Val Thr Glu Ser Trp Asp Glu Asp Tyr
                180   185   190

```
cat cac ggc cag gag tcg ctc cac tac gag ggc cga gcg gtg acc att    624
His His Gly Gln Glu Ser Leu His Tyr Glu Gly Arg Ala Val Thr Ile
        195                 200                 205

gcc acc tcc gat cgc gac cag tcc aaa tac ggc atg ctc gct cgc ctg    672
Ala Thr Ser Asp Arg Asp Gln Ser Lys Tyr Gly Met Leu Ala Arg Leu
        210                 215                 220

gcc gtc gag gct gga ttc gat tgg gtc tcc tac gtc agc agg cgc cac    720
Ala Val Glu Ala Gly Phe Asp Trp Val Ser Tyr Val Ser Arg Arg His
225                 230                 235                 240

atc tac tgc tcc gtc aag tca gat tcg tcg atc agt tcc cac gtg cac    768
Ile Tyr Cys Ser Val Lys Ser Asp Ser Ser Ile Ser Ser His Val His
                245                 250                 255

ggc tgc ttc acg ccg gag agc aca gcg ctg ctg gag agt gga gtc cgg    816
Gly Cys Phe Thr Pro Glu Ser Thr Ala Leu Leu Glu Ser Gly Val Arg
            260                 265                 270

aag ccg ctc ggc gag ctc tct atc gga gat cgt gtt ttg agc atg acc    864
Lys Pro Leu Gly Glu Leu Ser Ile Gly Asp Arg Val Leu Ser Met Thr
            275                 280                 285

gcc aac gga cag gcc gtc tac agc gaa gtg atc ctc ttc atg gac cgc    912
Ala Asn Gly Gln Ala Val Tyr Ser Glu Val Ile Leu Phe Met Asp Arg
        290                 295                 300

aac ctc gag cag atg caa aac ttt gtg cag ctg cac acg gac ggt gga    960
Asn Leu Glu Gln Met Gln Asn Phe Val Gln Leu His Thr Asp Gly Gly
305                 310                 315                 320

gca gtg ctc acg gtg acg ccg gct cac ctg gtt agc gtt tgg cag ccg   1008
Ala Val Leu Thr Val Thr Pro Ala His Leu Val Ser Val Trp Gln Pro
                325                 330                 335

gag agc cag aag ctc acg ttt gtg ttt gcg cat cgc atc gag gag aag   1056
Glu Ser Gln Lys Leu Thr Phe Val Phe Ala His Arg Ile Glu Glu Lys
            340                 345                 350

aac cag gtg ctc gta cgg gat gtg gag acg ggc gag ctg agg ccc cag   1104
Asn Gln Val Leu Val Arg Asp Val Glu Thr Gly Glu Leu Arg Pro Gln
            355                 360                 365

cga gtg gtc aag ttg ggc agt gtg cgc agt aag ggc gtg gtc gcg ccg   1152
Arg Val Val Lys Leu Gly Ser Val Arg Ser Lys Gly Val Val Ala Pro
        370                 375                 380

ctg acc cgc gag ggc acc att gtg gtc aac tcg gtg gcc gcc agt tgc   1200
Leu Thr Arg Glu Gly Thr Ile Val Val Asn Ser Val Ala Ala Ser Cys
385                 390                 395                 400

tat gcg gtg atc aac agt cag tcg ctg gcc cac tgg gga ctg gct ccc   1248
Tyr Ala Val Ile Asn Ser Gln Ser Leu Ala His Trp Gly Leu Ala Pro
                405                 410                 415
```

```
atg cgc ctg ctg tcc acg ctg gag gcg tgg ctg ccc gcc aag gag cag    1296
Met Arg Leu Leu Ser Thr Leu Glu Ala Trp Leu Pro Ala Lys Glu Gln
            420                 425                 430

ttg cac agt tcg ccg aag gtg gtg agc tcg gcg cag cag cag aat ggc    1344
Leu His Ser Ser Pro Lys Val Val Ser Ser Ala Gln Gln Gln Asn Gly
            435                 440                 445

atc cat tgg tat gcc aat gcg ctc tac aag gtc aag gac tac gtg ctg    1392
Ile His Trp Tyr Ala Asn Ala Leu Tyr Lys Val Lys Asp Tyr Val Leu
            450                 455                 460

ccg cag agc tgg cgc cac gat tga                                    1416
Pro Gln Ser Trp Arg His Asp
465                 470
```

<210> 20
<211> 471
<212> PRT
<213> Drosophila melanogaster

<400> 20

```
Met Asp Asn His Ser Ser Val Pro Trp Ala Ser Ala Ala Ser Val Thr
 1               5                  10                  15

Cys Leu Ser Leu Gly Cys Gln Met Pro Gln Phe Gln Phe Gln Phe Gln
            20                  25                  30

Leu Gln Ile Arg Ser Glu Leu His Leu Arg Lys Pro Ala Arg Arg Thr
            35                  40                  45

Gln Thr Met Arg His Ile Ala His Thr Gln Arg Cys Leu Ser Arg Leu
     50                  55                  60

Thr Ser Leu Val Ala Leu Leu Leu Ile Val Leu Pro Met Val Phe Ser
 65                  70                  75                  80

Pro Ala His Ser Cys Gly Pro Gly Arg Gly Leu Gly Arg His Arg Ala
                85                  90                  95

Arg Asn Leu Tyr Pro Leu Val Leu Lys Gln Thr Ile Pro Asn Leu Ser
            100                 105                 110

Glu Tyr Thr Asn Ser Ala Ser Gly Pro Leu Glu Gly Val Ile Arg Arg
            115                 120                 125

Asp Ser Pro Lys Phe Lys Asp Leu Val Pro Asn Tyr Asn Arg Asp Ile
     130                 135                 140

Leu Phe Arg Asp Glu Glu Gly Thr Gly Ala Asp Gly Leu Met Ser Lys
145                 150                 155                 160

Arg Cys Lys Glu Lys Leu Asn Val Leu Ala Tyr Ser Val Met Asn Glu
                165                 170                 175
```

```
Trp Pro Gly Ile Arg Leu Leu Val Thr Glu Ser Trp Asp Glu Asp Tyr
        180                 185             190

His His Gly Gln Glu Ser Leu His Tyr Glu Gly Arg Ala Val Thr Ile
        195             200             205

Ala Thr Ser Asp Arg Asp Gln Ser Lys Tyr Gly Met Leu Ala Arg Leu
    210             215             220

Ala Val Glu Ala Gly Phe Asp Trp Val Ser Tyr Val Ser Arg Arg His
225             230             235             240

Ile Tyr Cys Ser Val Lys Ser Asp Ser Ser Ile Ser Ser His Val His
            245             250             255

Gly Cys Phe Thr Pro Glu Ser Thr Ala Leu Leu Glu Ser Gly Val Arg
            260             265             270

Lys Pro Leu Gly Glu Leu Ser Ile Gly Asp Arg Val Leu Ser Met Thr
        275             280             285

Ala Asn Gly Gln Ala Val Tyr Ser Glu Val Ile Leu Phe Met Asp Arg
    290             295             300

Asn Leu Glu Gln Met Gln Asn Phe Val Gln Leu His Thr Asp Gly Gly
305             310             315             320

Ala Val Leu Thr Val Thr Pro Ala His Leu Val Ser Val Trp Gln Pro
            325             330             335

Glu Ser Gln Lys Leu Thr Phe Val Phe Ala His Arg Ile Glu Glu Lys
            340             345             350

Asn Gln Val Leu Val Arg Asp Val Glu Thr Gly Glu Leu Arg Pro Gln
        355             360             365

Arg Val Val Lys Leu Gly Ser Val Arg Ser Lys Gly Val Val Ala Pro
    370             375             380

Leu Thr Arg Glu Gly Thr Ile Val Val Asn Ser Val Ala Ala Ser Cys
385             390             395             400

Tyr Ala Val Ile Asn Ser Gln Ser Leu Ala His Trp Gly Leu Ala Pro
            405             410             415

Met Arg Leu Leu Ser Thr Leu Glu Ala Trp Leu Pro Ala Lys Glu Gln
        420             425             430

Leu His Ser Ser Pro Lys Val Val Ser Ser Ala Gln Gln Gln Asn Gly
        435             440             445

Ile His Trp Tyr Ala Asn Ala Leu Tyr Lys Val Lys Asp Tyr Val Leu
    450             455             460

Pro Gln Ser Trp Arg His Asp
465             470
```

<210> 21
<211> 522
<212> DNA
<213> Homo sapiens

<400> 21
tgcggaccgg gcagggggtt cgggaagagg aggcacccca aaaagctgac ccctttagcc 60
tacaagcagt ttatccccaa tgtggccgag aagaccctag gcgccagcgg aaggtatgaa 120
gggaagatct ccagaaactc cgagcgattt aaggaactca cccccaatta caaccccgac 180
atcatattta aggatgaaga aaacaccgga gcggacaggc tgatgactca gaggtgtaag 240
gacaagttga acgctttggc catctcggtg atgaaccagt ggccaggagt gaaactgcgg 300
gtgaccgagg gctgggacga agatggccac cactcagagg agtctctgca ctacgaggc 360
cgcgcagtgg acatcaccac gtctgaccgc gaccgcagca agtacggcat gctggcccgc 420
ctggcggtgg aggccggctt cgactgggtg tactacgagt ccaaggcaca tatccactgc 480
tcggtgaaag cagagaactc ggtggcggcc aaatcgggag gc 522

<210> 22
<211> 525
<212> DNA
<213> Homo sapiens

<400> 22
tgcgggccgg gtcgggtggt gggcagccgc cggcgaccgc cacgcaaact cgtgccgctc 60
gcctacaagc agttcagccc caatgtgccc gagaagaccc tgggcgccag cggacgctat 120
gaaggcaaga tcgctcgcag ctccgagcgc ttcaaggagc tcacccccaa ttacaatcca 180
gacatcatct tcaaggacga ggagaacaca ggcgccgacc gcctcatgac ccagcgctgc 240
aaggaccgcc tgaactcgct ggctatctcg gtgatgaacc agtggcccgg tgtgaagctg 300
cgggtgaccg agggctggga cgaggacggc caccactcag aggagtccct gcattatgag 360
ggccgcgcgg tggacatcac cacatcagac cgcgaccgca ataagtatgg actgctggcg 420
cgcttggcag tggaggccgg ctttgactgg gtgtattacg agtcaaaggc ccacgtgcat 480
tgctccgtca agtccgagca ctcggccgca gccaagacgg cggc 525

<210> 23
<211> 174
<212> PRT
<213> Homo sapiens

<400> 23
Cys Gly Pro Gly Arg Val Val Gly Ser Arg Arg Pro Pro Arg Lys
1   5   10   15

Leu Val Pro Leu Ala Tyr Lys Gln Phe Ser Pro Asn Val Pro Glu Lys
            20   25   30

Thr Leu Gly Ala Ser Gly Arg Tyr Glu Gly Lys Ile Ala Arg Ser Ser
        35   40   45

Glu Arg Phe Lys Glu Leu Thr Pro Asn Tyr Asn Pro Asp Ile Ile Phe
    50   55   60

Lys Asp Glu Glu Asn Thr Gly Ala Asp Arg Leu Met Thr Gln Arg Cys
65   70   75   80

```
Lys Asp Arg Leu Asn Ser Leu Ala Ile Ser Val Met Asn Gln Trp Pro
                85                  90                  95

Gly Val Lys Leu Arg Val Thr Glu Gly Trp Asp Glu Asp Gly His His
            100                 105                 110

Ser Glu Glu Ser Leu His Tyr Glu Gly Arg Ala Val Asp Ile Thr Thr
            115                 120                 125

Ser Asp Arg Asp Arg Asn Lys Tyr Gly Leu Leu Ala Arg Leu Ala Val
        130                 135                 140

Glu Ala Gly Phe Asp Trp Val Tyr Tyr Glu Ser Lys Ala His Val His
145                 150                 155                 160

Cys Ser Val Lys Ser Glu His Ser Ala Ala Ala Lys Thr Gly Gly
                165                 170                 175


<210> 24
<211> 174
<212> PRT
<213> Homo sapiens

<400> 24
Cys Gly Pro Gly Arg Gly Phe Gly Lys Arg Arg His Pro Lys Lys Leu
  1               5                  10                  15

Thr Pro Leu Ala Tyr Lys Gln Phe Ile Pro Asn Val Ala Glu Lys Thr
                20                  25                  30

Leu Gly Ala Ser Gly Arg Tyr Glu Gly Lys Ile Ser Arg Asn Ser Glu
            35                  40                  45

Arg Phe Lys Glu Leu Thr Pro Asn Tyr Asn Pro Asp Ile Ile Phe Lys
    50                  55                  60

Asp Glu Glu Asn Thr Gly Ala Asp Arg Leu Met Thr Gln Arg Cys Lys
65                  70                  75                  80

Asp Lys Leu Asn Ala Leu Ala Ile Ser Val Met Asn Gln Trp Pro Gly
                85                  90                  95

Val Lys Leu Arg Val Thr Glu Gly Trp Asp Glu Asp Gly His His Ser
            100                 105                 110

Glu Glu Ser Leu His Tyr Glu Gly Arg Ala Val Asp Ile Thr Thr Ser
            115                 120                 125

Asp Arg Asp Arg Ser Lys Tyr Gly Met Leu Ala Arg Leu Ala Val Glu
        130                 135                 140

Ala Gly Phe Asp Trp Val Tyr Tyr Glu Ser Lys Ala His Ile His Cys
145                 150                 155                 160

Ser Val Lys Ala Glu Asn Ser Val Ala Ala Lys Ser Gly Gly
                165                 170
```

<210> 25
<211> 176
<212> PRT
<213> Homo sapiens

<400> 25
Cys Gly Pro Gly Arg Gly Pro Val Gly Arg Arg Arg Tyr Ala Arg Lys
1   5   10   15

Gln Leu Val Pro Leu Leu Tyr Lys Gln Phe Val Pro Gly Val Pro Glu
                20   25   30

Arg Thr Leu Gly Ala Ser Gly Pro Ala Glu Gly Arg Val Ala Arg Gly
            35   40   45

Ser Glu Arg Phe Arg Asp Leu Val Pro Asn Tyr Asn Pro Asp Ile Ile
        50   55   60

Phe Lys Asp Glu Glu Asn Ser Gly Ala Asp Arg Leu Met Thr Glu Arg
65   70   75   80

Cys Lys Glu Arg Val Asn Ala Leu Ala Ile Ala Val Met Asn Met Trp
                85   90   95

Pro Gly Val Arg Leu Arg Val Thr Glu Gly Trp Asp Glu Asp Gly His
            100   105   110

His Ala Gln Asp Ser Leu His Tyr Glu Gly Arg Ala Leu Asp Ile Thr
            115   120   125

Thr Ser Asp Arg Asp Arg Asn Lys Tyr Gly Leu Leu Ala Arg Leu Ala
        130   135   140

Val Glu Ala Gly Phe Asp Trp Val Tyr Tyr Glu Ser Arg Asn His Val
145   150   155   160

His Val Ser Val Lys Ala Asp Asn Ser Leu Ala Val Arg Ala Gly Gly
                165   170   175

<210> 26
<211> 175
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Consensus
      sequence

<220>
<221> SITE
<222> (1)

```
<223> Xaa=Cys that may be modified, altered or
      substituted within another moiety or series of
      moieties as described herein

<220>
<221> SITE
<222> (6)
<223> Xaa=Val or Gly

<220>
<221> SITE
<222> (7)
<223> Xaa=Val, Glu or Pro

<220>
<221> SITE
<222> (8)
<223> Xaa=Gly or Val

<220>
<221> SITE
<222> (9)
<223> Xaa=Ser or Gly

<220>
<221> SITE
<222> (10)
<223> Xaa=Arg or Lys

<220>
<221> SITE
<222> (13)
<223> Xaa=Pro, His or Tyr

<220>
<221> SITE
<222> (14)
<223> Xaa=Pro or Ala

<220>
<221> SITE
<222> (15)
<223> Xaa=Arg or Lys

<220>
<221> SITE
<222> (17)
<223> Xaa=any amino acid

<220>
<221> SITE
<222> (19)
<223> Xaa=Val or Thr

<220>
<221> SITE
<222> (22)
```

```
<223> Xaa=Ala or Leu

<220>
<221> SITE
<222> (27)
<223> Xaa=Ser, Ile or Val

<220>
<221> SITE
<222> (29)
<223> Xaa=Asn or Gly

<220>
<221> SITE
<222> (31)
<223> Xaa=Pro ar Ala

<220>
<221> SITE
<222> (41)
<223> Xaa=Tyr or Ala

<220>
<221> SITE
<222> (45)
<223> Xaa=Ile or Val

<220>
<221> SITE
<222> (46)
<223> Xaa=Ala or Ser

<220>
<221> SITE
<222> (48)
<223> Xaa=Ser, Asn or Gly

<220>
<221> SITE
<222> (54)
<223> Xaa=Glu or Asp

<220>
<221> SITE
<222> (56)
<223> Xaa=Thr or Val

<220>
<221> SITE
<222> (71)
<223> Xaa=Thr or Ser

<220>
<221> SITE
<222> (79)
<223> Xaa=Gln or Glu
```

```
<220>
<221> SITE
<222> (83)
<223> Xaa=Asp or Glu

<220>
<221> SITE
<222> (84)
<223> Xaa=Arg or Lys

<220>
<221> SITE
<222> (85)
<223> Xaa=Leu or Val

<220>
<221> SITE
<222> (91)
<223> Xaa=Ser or Ala

<220>
<221> SITE
<222> (95)
<223> Xaa=Gln or Met

<220>
<221> SITE
<222> (114)
<223> Xaa=Ser or Ala

<220>
<221> SITE
<222> (115)
<223> Xaa=Glu or Gln

<220>
<221> SITE
<222> (116)
<223> Xaa=Glu or Asp

<220>
<221> SITE
<222> (135)
<223> Xaa=Asn or Ser

<220>
<221> SITE
<222> (139)
<223> Xaa=Leu or Met

<220>
<221> SITE
<222> (157)
<223> Xaa=Lys or Arg

<220>
<221> SITE
```

```
<222> (158)
<223> Xaa=Ala or Asn

<220>
<221> SITE
<222> (160)
<223> Xaa=Val or Ile

<220>
<221> SITE
<222> (162)
<223> Xaa=Cys or Val

<220>
<221> SITE
<222> (166)
<223> Xaa=Ser or Ala

<220>
<221> SITE
<222> (167)
<223> Xaa=Glu or Asp

<220>
<221> SITE
<222> (168)
<223> Xaa=His or Asn

<220>
<221> SITE
<222> (169)
<223> Xaa=Ala, Val or Leu

<220>
<221> SITE
<222> (172)
<223> Xaa=Lys or Arg

<220>
<221> SITE
<222> (173)
<223> Xaa=Thr, Ser or Ala

<400> 26
Xaa Gly Pro Gly Arg Xaa Xaa Xaa Xaa Xaa Arg Arg Xaa Xaa Xaa Lys
 1               5                  10                  15

Xaa Leu Xaa Pro Leu Xaa Tyr Lys Gln Phe Xaa Pro Xaa Val Xaa Glu
          20                  25                  30

Lys Thr Leu Gly Ala Ser Gly Arg Xaa Glu Gly Lys Xaa Xaa Arg Xaa
          35                  40                  45

Ser Glu Arg Phe Lys Xaa Leu Xaa Pro Asn Tyr Asn Pro Asp Ile Ile
    50                  55                  60
```

```
Phe Lys Asp Glu Glu Asn Xaa Gly Ala Asp Arg Leu Met Thr Xaa Arg
    65                70                75                80

Cys Lys Xaa Xaa Xaa Asn Ser Leu Ala Ile Xaa Val Met Asn Xaa Trp
                85                90                95

Pro Gly Val Lys Leu Arg Val Thr Glu Gly Trp Asp Glu Asp Gly His
            100               105               110

His Xaa Xaa Xaa Ser Leu His Tyr Glu Gly Arg Ala Val Asp Ile Thr
        115               120               125

Thr Ser Asp Arg Asp Arg Xaa Lys Tyr Gly Xaa Leu Ala Arg Leu Ala
    130               135               140

Val Glu Ala Gly Phe Asp Trp Val Tyr Tyr Glu Ser Xaa Xaa His Xaa
145               150               155               160

His Xaa Ser Val Lys Xaa Xaa Xaa Xaa Ala Ala Xaa Xaa Gly Gly
                165               170               175


<210> 27
<211> 528
<212> DNA
<213> Homo sapiens

<400> 27
tgcgggccgg gccggggggcc ggttggccgg cgccgctatg cgcgcaagca gctcgtgccg 60
ctactctaca agcaatttgt gcccggcgtg ccagagcgga ccctgggcgc cagtgggcca 120
gcggagggga gggtggcaag gggctccgag cgcttccggg acctcgtgcc caactacaac 180
cccgacatca tcttcaagga tgaggagaac agtggagccg accgcctgat gaccgagcgt 240
tgtaaggagc gggtgaacgc tttggccatt gccgtgatga catgtggcc cggagtgcgc 300
ctacgagtga ctgagggctg ggacgaggac ggccaccacg ctcaggattc actccactac 360
gaaggccgtg ctttggacat cactacgtct gaccgcgacc gcaacaagta tgggttgctg 420
gcgcgcctcg cagtggaagc cggcttcgac tgggtctact acgagtcccg caaccacgtc 480
cacgtgtcgg tcaaagctga taactcactg gcggtccggg cgggcggc 528


<210> 28
<211> 684
<212> DNA
<213> Homo sapiens

<400> 28
gtcgacaaaa ctcacacatg cccaccgtgc ccagcacctg aactcctggg gggaccgtca 60
gtcttcctct tccccccaaa acccaaggac accctcatga tctcccggac ccctgaggtc 120
acatgcgtgg tggtggacgt gagccacgaa gaccctgagg tcaagttcaa ctggtacgtg 180
gacggcgtgg aggtgcataa tgccaagaca aagccgcggg aggagcagta ccagagcacg 240
taccgtgtgg tcagcgtcct caccgtcctg caccaggact ggctgaatgg caaggagtac 300
aagtgcaagg tctccaacaa agccctccca gcccccatcg agaaaaccat ctccaaagcc 360
aaagggcagc cccgagaacc acaggtgtac accctgcccc catcccggga tgagctgacc 420
aagaaccagg tcagcctgac ctgcctggtc aaaggcttct atcccagcga catcgccgtg 480
gagtgggaga gcaatgggca gccggagaac aactacaaga ccacgcctcc cgtgttggac 540
tccgacggct ccttcttcct ctacagcaag ctcaccgtgg acaagagcag gtggcagcag 600
gggaacgtct tctcatgctc cgtgatgcat gaggctctgc acaaccacta cacgcagaag 660
agcctctccc tgtctcccgg gaaa 684
```

<210> 29
<211> 687
<212> DNA
<213> Homo sapiens

<400> 29
gtcgacgtgc ccagggattg tggttgtaag ccttgcatat gtacagtccc agaagtatca 60
tctgtcttca tcttcccccc aaagcccaag gatgtgctca ccattactct gactcctaag 120
gtcacgtgtg ttgtggtaga catcagcaag gatgatcccg aggtccagtt cagctggttt 180
gtagatgatg tggaggtgca cacagctcag acgcaaccac gggaagagca gttccaaagc 240
actttccgct cagtcagtga acttcccatc atgcaccagg actggctcaa tggcaaggag 300
ttcaaatgca gggtcaacag tgcagctttc cctgccccca tcgagaaaac catctccaaa 360
accaaaggca gaccgaaggc tccacaggtg tacaccattc cacctcccaa ggagcagatg 420
gccaaggata aagtcagtct gacctgcatg ataacagact tcttccctga agacattact 480
gtggagtggc agtggaatgg gcagccagcg gagaactaca gaacactca gcccatcatg 540
gacacagatg gctcttactt cgtctacagc aagctcaatg tgcagaagag caactgggag 600
gcaggaaata ctttcacctg ctctgtgtta catgagggcc tgcacaacca ccatactgag 660
aagagcctct cccactctcc tggtaaa 687

<210> 30
<211> 702
<212> DNA
<213> Homo sapiens

<400> 30
gtcgacccca gagggcccac aatcaagccc tgtcctccat gcaaatgccc agcacctaac 60
ctcttgggtg gaccatccgt cttcatcttc cctccaaaga tcaaggatgt actcatgatc 120
tccctgagcc ccatagtcac atgtgtggtg gtggatgtga gcgaggatga cccagatgtc 180
cagatcagct ggtttgtgaa caacgtggaa gtacacacag ctcagacaca aacccataga 240
gaggattacc aaagtacact tcgggtggtc agtgccctcc ccatccagca ccaggactgg 300
atgagtggca aggagttcaa atgcaaggtc aacaacaaag acctcccagc gcccatcgag 360
agaaccatct caaaacccaa agggtcagta agagctccac aggtatatgt cttgcctcca 420
ccagaagaag agatgactaa gaaacaggtc actctgacct gcatggtgac agacttcatg 480
cctgaagaca tttacgtgga gtggaccaac aacgggaaaa cagagctaaa ctacaagaac 540
actgaaccag tcctggactc tgatggttct tacttcatgt acagcaagct gagagtggaa 600
aagaagaact gggtggaaag aaatagctac tcctgttcag tggtccacga gggtctgcac 660
aatcaccaca cgactaagag cttctcccgg actccgggta aa 702

<210> 31
<211> 9776
<212> DNA
<213> Plasmid P55

<400> 31
gatctaacat ccaaagacga aaggttgaat gaaacctttt tgccatccga catccacagg 60
tccattctca cacataagtg ccaaacgcaa caggagggga tacactagca gcagaccgtt 120
gcaaacgcag gacctccact cctcttctcc tcaacaccca cttttgccat cgaaaaacca 180
gcccagttat tgggcttgat tggagctcgc tcattccaat tccttctatt aggctactaa 240
caccatgact ttattagcct gtctatcctg gcccccctgg cgaggttcat gtttgtttat 300
ttccgaatgc aacaagctcc gcattacacc cgaacatcac tccagatgag ggctttctga 360
gtgtggggtc aaatagtttc atgttcccca atggcccaaa aactgacagt ttaaacgctg 420
tcttggaacc taatatgaca aaagcgtgat ctcatccaag atgaactaag tttggttcgt 480
tgaaatgcta acggccagtt ggtcaaaaag aaacttccaa aagtcgccat accgtttgtc 540

```
ttgtttggta ttgattgacg aatgctcaaa aataatctca ttaatgctta gcgcagtctc 600
tctatcgctt ctgaacccca gtgcacctgt gccgaaacgc aaatggggaa acacccgctt 660
tttggatgat tatgcattgt ctccacattg tatgcttcca agattctggt gggaatactg 720
ctgatagcct aacgttcatg atcaaaattt aactgttcta acccctactt gacagcaata 780
tataaacaga aggaagctgc cctgtcttaa accttttttt ttatcatcat tattagctta 840
ctttcataat tgcgactggt tccaattgac aagcttttga ttttaacgac ttttaacgac 900
aacttgagaa gatcaaaaaa caactaatta ttcgaaggat ccaaacgatg agatttcctt 960
caatttttac tgcagtttta ttcgcagcat cctccgcatt agctgctcca gtcaacacta 1020
caacagaaga tgaaacggca caaattccgg ctgaagctgt catcggttac tcagatttag 1080
aaggggattt cgatgttgct gtttttgccat tttccaacag cacaaataac gggttattgt 1140
ttataaatac tactattgcc agcattgctg ctaaagaaga agggggtatct ctcgagaaaa 1200
gatgcggacc gggcaggggg ttcgggaaga ggaggcaccc caaaaagctg acccctttag 1260
cctacaagca gtttatcccc aatgtggccg agaagaccct aggcgccagc ggaaggtatg 1320
aagggaagat ctccagaaac tccgagcgat ttaaggaact cacccccaat tacaaccccg 1380
acatcatatt taaggatgaa gaaaacaccg gagcggacag gctgatgact cagaggtgta 1440
aggacaagtt gaacgctttg gccatctcgg tgatgaacca gtggccagga gtgaaactgc 1500
gggtgaccga gggctgggac gaagatggcc accactcaga ggagtctctg cactacgagg 1560
gccgcgcagt ggacatcacc acgtctgacc gcgaccgcag caagtacggc atgctggccc 1620
gcctggcggt ggaggccggc ttcgactggg tgtactacga gtccaaggca catatccact 1680
gctcggtgaa agcagagaac tcggtggcgg ccaaatcggg aggctgattc gcggccgcga 1740
attaattcgc cttagacatg actgttcctc agttcaagtt gggcacttac gagaagaccg 1800
gtcttgctag attctaatca agaggatgtc agaatgccat ttgcctgaga gatgcaggct 1860
tcatttttga tactttttta tttgtaacct atatagtata ggattttttt tgtcattttg 1920
tttcttctcg tacgagcttg ctcctgatca gcctatctcg cagctgatga atatcttgtg 1980
gtaggggttt gggaaaatca ttcgagtttg atgttttttct tggtatttcc cactcctctt 2040
cagagtacag aagattaagt gagaagttcg tttgtgcaag cttatcgata agctttaatg 2100
cggtagttta tcacagttaa attgctaacg cagtcaggca ccgtgtatga aatctaacaa 2160
tgcgctcatc gtcatcctcg gcaccgtcac cctggatgct gtaggcatag gcttggttat 2220
gccggtactg ccgggcctct tgcgggatat cgtccattcc gacagcatcg ccagtcacta 2280
tggcgtgctg ctagcgctat atgcgttgat gcaatttcta tgcgcacccg ttctcggagc 2340
actgtccgac cgctttggcc gccgcccagt cctgctcgct tcgctacttg gagccactat 2400
cgactacgcg atcatggcga ccacacccgt cctgtggatc tatcgaatct aaatgtaagt 2460
taaaatctct aaataattaa ataagtccca gtttctccat acgaacctta acagcattgc 2520
ggtgagcatc tagaccttca acagcagcca gatccatcac tgcttggcca atatgtttca 2580
gtccctcagg agttacgtct tgtgaagtga tgaacttctg gaaggttgca gtgttaactc 2640
cgctgtattg acgggcatat ccgtacgttg gcaaagtgtg gttggtaccg gaggagtaat 2700
ctccacaact ctctggagag taggcaccaa caaacacaga tccagcgtgt tgtacttgat 2760
caacataaga agaagcattc tcgatttgca ggatcaagtg ttcaggagcg tactgattgg 2820
acatttccaa agcctgctcg taggttgcaa ccgatagggt tgtagagtgt gcaatacact 2880
tgcgtacaat ttcaaccctt ggcaactgca cagcttggtt gtgaacagca tcttcaattc 2940
tggcaagctc cttgtctgtc atatcgacag ccaacagaat cacctgggaa tcaataccat 3000
gttcagcttg agcagaaggt ctgaggcaac gaaatctgga tcagcgtatt tatcagcaat 3060
aactagaact tcagaaggcc cagcaggcat gtcaatacta cacagggctg atgtgtcatt 3120
ttgaaccatc atcttggcag cagtaacgaa ctggtttcct ggaccaaata ttttgtcaca 3180
cttaggaaca gtttctgttc cgtaagccat agcagctact gcctgggcgc ctcctgctag 3240
cacgatacac ttagcaccaa ccttgtgggc aacgtagatg acttctgggg taagggtacc 3300
atccttctta ggtggagatg caaaaacaat ttctttgcaa ccagcaactt tggcaggaac 3360
acccagcatc agggaagtgg aaggcagaat tgcggttcca ccaggaatat agaggccaac 3420
tttctcaata ggtcttgcaa aacgagagca gactacacca gggcaagtct caacttgcaa 3480
cgtctccgtt agttgagctt catggaattt cctgacgtta tctatagaga gatcaatggc 3540
tctcttaacg ttatctggca attgcataag ttcctctggg aaaggagctt ctaacacagg 3600
tgtcttcaaa gcgactccat caaacttggc agttagttct aaaagggctt tgtcaccatt 3660
ttgacgaaca ttgtcgacaa ttggtttgac taattccata atctgttccg ttttctggat 3720
aggacgacga agggcatctt caatttcttg tgaggaggcc ttagaaacgt caattttgca 3780
caattcaata cgaccttcag aagggacttc tttaggtttg gattcttctt taggttgttc 3840
cttggtgtat cctggcttgg catctccttt ccttctagtg acctttaggg acttcatatc 3900
caggtttctc tccacctcgt ccaacgtcac accgtacttg gcacatctaa ctaatgcaaa 3960
```

```
ataaaataag tcagcacatt cccaggctat atcttccttg gatttagctt ctgcaagttc 4020
atcagcttcc tccctaattt tagcgttcaa acaaaacttc gtcgtcaaat aaccgtttgg 4080
tataagaacc ttctggagca ttgctcttac gatcccacaa ggtgcttcca tggctctaag 4140
accctttgat tggccaaaac aggaagtgcg ttccaagtga cagaaaccaa cacctgtttg 4200
ttcaaccaca aatttcaagc agtctccatc acaatccaat tcgataccca gcaacttttg 4260
agttcgtcca gatgtagcac ctttatacca caaaccgtga cgacgagatt ggtagactcc 4320
agtttgtgtc cttatagcct ccggaataga cttttttggac gagtacacca ggcccaacga 4380
gtaattagaa gagtcagcca ccaaagtagt gaatagacca tcggggcggt cagtagtcaa 4440
agacgccaac aaaatttcac tgacagggaa ctttttgaca tcttcagaaa gttcgtattc 4500
agtagtcaat tgccgagcat caataatggg gattatacca gaagcaacag tggaagtcac 4560
atctaccaac tttgcggtct cagaaaaagc ataaacagtt ctactaccgc cattagtgaa 4620
acttttcaaa tcgcccagtg gagaagaaaa aggcacagcg atactagcat tagcgggcaa 4680
ggatgcaact ttatcaacca gggtcctata gataacccta gcgcctggga tcatcctttg 4740
gacaactctt tctgccaaat ctaggtccaa aatcacttca ttgataccat tattgtacaa 4800
cttgagcaag ttgtcgatca gctcctcaaa ttggtcctct gtaacggatg actcaacttg 4860
cacattaact tgaagctcag tcgattgagt gaacttgatc aggttgtgca gctggtcagc 4920
agcataggga aacacggctt ttcctaccaa actcaaggaa ttatcaaact ctgcaacact 4980
tgcgtatgca ggtagcaagg gaaatgtcat acttgaagtc ggacagtgag tgtagtcttg 5040
agaaattctg aagccgtatt tttattatca gtgagtcagt catcaggaga tcctctacgc 5100
cggacgcatc gtggccgacc tgcaggtcgg catcaccggc gccacaggtg cggttgctgg 5160
cgcctatatc gccgacatca ccgatgggga agatcgggct cgccacttcg ggctcatgag 5220
cgcttgtttc ggcgtgggta tggtggcagg ccccgtggcc gggggactgt tgggcgccat 5280
ctccttggac ctgcaggggg gggggggaa agccacgttg tgtctcaaaa tctctgatgt 5340
tacattgcac aagataaaaa tatatcatca tgaacaataa aactgtctgc ttacataaac 5400
agtaatacaa ggggtgttat gagccatatt caacgggaaa cgtcttgctc aaggccgcga 5460
ttaaattcca acatggatgc tgatttatat gggtataaat gggctcgcga taatgtcggg 5520
caatcaggtg cgacaatcta tcgattgtat gggaagcccg atgcgccaga gttgtttctg 5580
aaacatggca aaggtagcgt tgccaatgat gttacagatg agatggtcag actaaactgg 5640
ctgacggaat ttatgcctct tccgaccatc aagcatttta tccgtactcc tgatgatgca 5700
tggttactca ccactgcgat ccccgggaaa acagcattcc aggtattaga agaatatcct 5760
gattcaggtg aaaatattgt tgatgcgctg gcagtgttcc tgcgccggtt gcattcgatt 5820
cctgtttgta attgtccttt taacagcgat cgcgtatttc gtctcgctca ggcgcaatca 5880
cgaatgaata acggtttggt tgatgcgagt gattttgatg acgagcgtaa tggctggcct 5940
gttgaacaag tctggaaaga aatgcataag cttttgccat tctcaccgga ttcagtcgtc 6000
actcatggtg atttctcact tgataacctt atttttgacg aggggaaatt aataggttgt 6060
attgatgttg gacgagtcgg aatcgcagac cgataccagg atcttgccat cctatggaac 6120
tgcctcggtg agttttctcc ttcattacag aaacggcttt ttcaaaaata tggtattgat 6180
aatcctgata tgaataaatt gcagtttcat ttgatgctcg atgagttttt ctaatcagaa 6240
ttggttaatt ggttgtaaca ctggcagagc attacgctga cttgacggga cggcggcttt 6300
gttgaataaa tcgaactttt gctgagttga aggatcagat cacgcatctt cccgacaacg 6360
cagaccgttc cgtggcaaag caaaagttca aaatcaccaa ctggtccacc tacaacaaag 6420
ctctcatcaa ccgtggctcc ctcactttct ggctggatga tggggcgatt caggcctggt 6480
atgagtcagc aacaccttct tcacgaggca gacctcagcg ccccccccccc cctgcaggtc 6540
ccacggcggc ggtgctcaac ggcctcaacc tactactggg ctgcttccta atgcaggagt 6600
cgcataaggg agagcgtcga gtatctatga ttggaagtat gggaatggtg atacccgcat 6660
tcttcagtgt cttgaggtct cctatcagat tatgcccaac taaagcaacc ggaggaggag 6720
atttcatggt aaatttctct gacttttggt catcagtaga ctcgaactgt gagactatct 6780
cggttatgac agcagaaatg tccttcttgg agacagtaaa tgaagtccca ccaataaaga 6840
aatccttgtt atcaggaaca aacttcttgt ttcgaacttt ttcggtgcct tgaactataa 6900
aatgtagagt ggatatgtcg ggtaggaatg gagcgggcaa atgcttacct tctggacctt 6960
caagaggtat gtagggtttg tagatactga tgccaacttc agtgacaacg ttgctatttc 7020
gttcaaacca ttccgaatcc agagaaatca aagttgtttg tctactattg atccaagcca 7080
gtgcggtctt gaaactgaca atagtgtgct cgtgttttga ggtcatcttt gtatgaataa 7140
atctagtctt tgatctaaat aatcttgacg agccaaggcg ataaataccc aaatctaaaa 7200
ctcttttaaa acgttaaaag gacaagtatg tctgcctgta ttaaacccca aatcagctcg 7260
tagtctgatc ctcatcaact tgaggggcac tatcttgttt tagagaaatt gcggagatg 7320
cgatatcgag aaaaaggtac gctgatttta aacgtgaaat ttatctcaag atctctgcct 7380
```

```
cgcgcgtttc ggtgatgacg gtgaaaacct ctgacacatg cagctcccgg agacggtcac 7440
agcttgtctg taagcggatg ccgggagcag acaagcccgt cagggcgcgt cagcgggtgt 7500
tggcgggtgt cggggcgcag ccatgaccca gtcacgtagc gatagcggag tgtatactgg 7560
cttaactatg cggcatcaga gcagattgta ctgagagtgc accatatgcg gtgtgaaata 7620
ccgcacagat gcgtaaggag aaaataccgc atcaggcgct cttccgcttc ctcgctcact 7680
gactcgctgc gctcggtcgt tcggctgcgg cgagcggtat cagctcactc aaaggcggta 7740
atacggttat ccacagaatc aggggataac gcaggaaaga acatgtgagc aaaaggccag 7800
caaaaggcca ggaaccgtaa aaaggccgcg ttgctggcgt ttttccatag gctccgcccc 7860
cctgacgagc atcacaaaaa tcgacgctca agtcagaggt ggcgaaaccc gacaggacta 7920
taaagatacc aggcgtttcc ccctggaagc tccctcgtgc gctctcctgt tccgaccctg 7980
ccgcttaccg gatacctgtc cgcctttctc ccttcgggaa gcgtggcgct ttctcaatgc 8040
tcacgctgta ggtatctcag ttcggtgtag gtcgttcgct ccaagctggg ctgtgtgcac 8100
gaacccccg ttcagcccga ccgctgcgcc ttatccggta actatcgtct tgagtccaac 8160
ccggtaagac acgacttatc gccactggca gcagccactg gtaacaggat tagcagagcg 8220
aggtatgtag gcggtgctac agagttcttg aagtggtggc ctaactacgg ctacactaga 8280
aggacagtat ttggtatctg cgctctgctg aagccagtta ccttcggaaa aagagttggt 8340
agctcttgat ccggcaaaca aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag 8400
cagattacgc gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc tacggggtct 8460
gacgctcagt ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt atcaaaaagg 8520
atcttcacct agatcctttt aaattaaaaa tgaagtttta aatcaatcta agtatatat 8580
gagtaaactt ggtctgacag ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc 8640
tgtctatttc gttcatccat agttgcctga ctccccgtcg tgtagataac tacgatacgg 8700
gagggcttac catctggccc cagtgctgca atgataccgc gagacccacg ctcaccggct 8760
ccagatttat cagcaataaa ccagccagcc ggaagggccg agcgcagaag tggtcctgca 8820
actttatccg cctccatcca gtctattaat tgttgccggg aagctagagt aagtagttcg 8880
ccagttaata gtttgcgcaa cgttgttgcc attgctgcag gcatcgtggt gtcacgctcg 8940
tcgtttggta tggcttcatt cagctccggt tcccaacgat caaggcgagt tacatgatcc 9000
cccatgttgt gcaaaaaagc ggttagctcc ttcggtcctc cgatcgttgt cagaagtaag 9060
ttggccgcag tgttatcact catggttatg gcagcactgc ataattctct tactgtcatg 9120
ccatccgtaa gatgcttttc tgtgactggt gagtactcaa ccaagtcatt ctgagaatag 9180
tgtatgcggc gaccgagttg ctcttgcccg gcgtcaacac gggataatac cgcgccacat 9240
agcagaactt aaaagtgct catcattgga aaacgttctt cggggcgaaa actctcaagg 9300
atcttaccgc tgttgagatc cagttcgatg taacccactc gtgcacccaa ctgatcttca 9360
gcatctttta ctttcaccag cgtttctggg tgagcaaaaa caggaaggca aaatgccgca 9420
aaaaagggaa taagggcgac acggaaatgt tgaatactca tactcttcct ttttcaatat 9480
tattgaagca tttatcaggg ttattgtctc atgagcggat acatatttga atgtatttag 9540
aaaaataaac aaataggggt tccgcgcaca tttccccgaa aagtgccacc tgacgtctaa 9600
gaaaccatta ttatcatgac attaacctat aaaaataggc gtatcacgag gccctttcgt 9660
cttcaagaat taattctcat gtttgacagc ttatcatcga taagctgact catgttggta 9720
ttgtgaaata gacgcagatc gggaacactg aaaaataaca gttattattc gagatc     9776


<210> 32
<211> 10491
<212> DNA
<213> Plasmid pUB114

<400> 32
gatctaacat ccaaagacga aaggttgaat gaaacctttt tgccatccga catccacagg 60
tccattctca cacataagtg ccaaacgcaa caggagggga tacactagca gcagaccgtt 120
gcaaacgcag gacctccact cctcttctcc tcaacaccca cttttgccat cgaaaaacca 180
gcccagttat tgggcttgat tggagctcgc tcattccaat tccttctatt aggctactaa 240
caccatgact ttattagcct gtctatcctg gccccctgg cgaggttcat gtttgtttat 300
ttccgaatgc aacaagctcc gcattacacc cgaacatcac tccagatgag ggctttctga 360
gtgtgggtc aaatagtttc atgttcccca aatggcccaa aactgacagt ttaaacgctg 420
tcttggaacc taatatgaca aaagcgtgat ctcatccaag atgaactaag tttggttcgt 480
tgaaatgcta acggccagtt ggtcaaaaag aaacttccaa aagtcgccat accgtttgtc 540
```

```
ttgtttggta ttgattgacg aatgctcaaa aataatctca ttaatgctta gcgcagtctc 600
tctatcgctt ctgaaccccg gtgcacctgt gccgaaacgc aaatggggaa acacccgctt 660
tttggatgat tatgcattgt ctccacattg tatgcttcca agattctggt gggaatactg 720
ctgatagcct aacgttcatg atcaaaattt aactgttcta acccctactt gacagcaata 780
tataaacaga aggaagctgc cctgtcttaa accttttttt tatcatcatt attagcttac 840
tttcataatt gcgactggtt ccaattgaca agcttttgat tttaacgact tttaacgaca 900
acttgagaag atcaaaaaac aactaattat tcgaaggatc caaacgatga gatttccttc 960
aattttact gcagttttat tcgcagcatc ctccgcatta gctgctccag tcaacactac 1020
aacagaagat gaaacggcac aaattccggc tgaagctgtc atcggttact cagatttaga 1080
aggggatttc gatgttgctg ttttgccatt ttccaacagc acaaataacg ggttattgtt 1140
tataaatact actattgcca gcattgctgc taaagaagaa ggggtatctc tcgagaaaag 1200
atgcggaccg ggcagggggt tcgggaagag gaggcacccc aaaaagctga cccctttagc 1260
ctacaagcag tttatcccca atgtggccga gaagacccta ggcgccagcg gaaggtatga 1320
agggaagatc tccagaaact ccgagcgatt taaggaactc accccaatt acaaccccga 1380-
catcatattt aaggatgaag aaaacaccgg agcggacagg ctgatgactc agaggtgtaa 1440
ggacaagttg aacgctttgg ccatctcggt gatgaaccag tggccaggag tgaaactgcg 1500
ggtgaccgag ggctgggacg aagatggcca ccactcagag gagtctctgc actacgaggg 1560
ccgcgcagtg gacatcacca cgtctgaccg cgaccgcagc aagtacggca tgctggcccg 1620
cctggcggtg gaggccggct tcgactgggt gtactacgag tccaaggcac atatccactg 1680
ctcggtgaaa gcagagaact cggtggcggc caaatcggga ggcgtcgacg tgcccaggga 1740
ttgtggttgt aagccttgca tatgtacagt cccagaagta tcatctgtct tcatcttccc 1800
cccaaagccc aaggatgtgc tcaccattac tctgactcct aaggtcacgt gtgttgtggt 1860
agacatcagc aaggatgatc ccgaggtcca gttcagctgg tttgtagatg atgtggaggt 1920
gcacacagct cagacgcaac cacgggaaga gcagttccaa agcactttcc gctcagtcag 1980
tgaacttccc atcatgcacc aggactggct caatggcaag gagttcaaat gcagggtcaa 2040
cagtgcagct ttccctgccc ccatcgagaa aaccatctcc aaaaccaaag gcagaccgaa 2100
ggctccacag gtgtacacca ttccacctcc caaggagcag atggccaagg ataaagtcag 2160
tctgacctgc atgataacag acttcttccc tgaagacatt actgtggagt ggcagtggaa 2220
tgggcagcca gcggagaact acaagaacac tcagcccatc atggacacag atggctctta 2280
cttcgtctac agcaagctca atgtgcagaa gagcaactgg gaggcaggaa atactttcac 2340
ctgctctgtg ttacatgagg gcctgcacaa ccaccatact gagaagagcc tctcccactc 2400
tcctggtaaa tgatcccagt gtccttggag ccctctggtc ctacagcggc cgcgaattaa 2460
ttcgccttag acatgactgt tcctcagttc aagttgggca cttacgagaa gaccggtctt 2520
gctagattct aatcaagagg atgtcagaat gccatttgcc tgagagatgc aggcttcatt 2580
tttgatactt ttttatttgt aacctatata gtataggatt ttttttgtca ttttgtttct 2640
tctcgtacga gcttgctcct gatcagccta tctcgcagct gatgaatatc ttgtggtagg 2700
ggtttgggaa aatcattcga gtttgatgtt tttcttggta tttcccactc ctcttcagag 2760
tacagaagat taagtgagaa gttcgtttgt gcaagcttat cgataagctt taatgcggta 2820
gtttatcaca gttaaattgc taacgcagtc aggcaccgtg tatgaaatct aacaatgcgc 2880
tcatcgtcat cctcggcacc gtcaccctgg atgctgtagg cataggcttg gttatgccgg 2940
tactgccggg cctcttgcgg gatatcgtcc attccgacag catcgccagt cactatggcg 3000
tgctgctagc gctatatgcg ttgatgcaat ttctatgcgc acccgttctc ggagcactgt 3060
ccgaccgctt tggccgccgc ccagtcctgc tcgcttcgct acttggagcc actatcgact 3120
acgcgatcat ggcgaccaca cccgtcctgt ggatctatcg aatctaaatg taagttaaaa 3180
tctctaaata attaaataag tcccagtttc tccatacgaa ccttaacagc attgcggtga 3240
gcatctagac cttcaacagc agccagatcc atcactgctt ggccaatatg tttcagtccc 3300
tcaggagtta cgtcttgtga agtgatgaac ttctggaagg ttgcagtgtt aactccgctg 3360
tattgacggg catatccgta cgttggcaaa gtgtggttgg taccggagga gtaatctcca 3420
caactctctg gagagtaggc accaacaaac acagatccag cgtgttgtac ttgatcaaca 3480
taagaagaag cattctcgat ttgcaggatc aagtgttcag gagcgtactg attggacatt 3540
tccaaagcct gctcgtaggt tgcaaccgat agggttgtag agtgtgcaat acacttgcgt 3600
acaatttcaa cccttggcaa ctgcacagct tggttgtgaa cagcatcttc aattctggca 3660
agctccttgt ctgtcatatc gacagccaac agaatcacct gggaatcaat accatgttca 3720
gcttgagcag aaggtctgag gcaacgaaat ctggatcagc gtatttatca gcaataacta 3780
gaacttcaga aggcccagca ggcatgtcaa tactacacag ggctgatgtg tcattttgaa 3840
ccatcatctt ggcagcagta acgaactggt ttcctggacc aaatattttg tcacacttag 3900
gaacagtttc tgttccgtaa gccatagcag ctactgcctg ggcgcctcct gctagcacga 3960
```

```
tacacttagc accaaccttg tgggcaacgt agatgacttc tggggtaagg gtaccatcct 4020
tcttaggtgg agatgcaaaa acaatttctt tgcaaccagc aactttggca ggaacaccca 4080
gcatcaggga agtggaaggc agaattgcgg ttccaccagg aatatagagg ccaactttct 4140
caataggtct tgcaaaacga gagcagacta caccagggca agtctcaact tgcaacgtct 4200
ccgttagttg agcttcatgg aatttcctga cgttatctat agagagatca atggctctct 4260
taacgttatc tggcaattgc ataagttcct ctgggaaagg agcttctaac acaggtgtct 4320
tcaaagcgac tccatcaaac ttggcagtta gttctaaaag ggctttgtca ccattttgac 4380
gaacattgtc gacaattggt ttgactaatt ccataatctg ttccgttttc tggataggac 4440
gacgaagggc atcttcaatt tcttgtgagg aggccttaga aacgtcaatt ttgcacaatt 4500
caatacgacc ttcagaaggg acttctttag gtttggattc ttctttaggt tgttccttgg 4560
tgtatcctgg cttggcatct cctttccttc tagtgacctt tagggacttc atatccaggt 4620
ttctctccac ctcgtccaac gtcacaccgt acttggcaca tctaactaat gcaaaataaa 4680
ataagtcagc acattcccag gctatatctt ccttggattt agcttctgca agttcatcag 4740
cttcctccct aattttagcg ttcaaacaaa acttcgtcgt caaataaccg tttggtataa 4800
gaaccttctg gagcattgct cttacgatcc cacaaggtgc ttccatggct ctaagaccct 4860
ttgattggcc aaaacaggaa gtgcgttcca agtgacagaa accaacacct gtttgttcaa 4920
ccacaaattt caagcagtct ccatcacaat ccaattcgat acccagcaac ttttgagttc 4980
gtccagatgt agcaccttta taccacaaac cgtgacgacg agattggtag actccagttt 5040
gtgtccttat agcctccgga atagactttt tggacgagta caccaggccc aacgagtaat 5100
tagaagagtc agccaccaaa gtagtgaata gaccatcggg gcggtcagta gtcaaagacg 5160
ccaacaaaat ttcactgaca gggaactttt tgacatcttc agaaagttcg tattcagtag 5220
tcaattgccg agcatcaata atggggatta taccagaagc aacagtggaa gtcacatcta 5280
ccaactttgc ggtctcagaa aaagcataaa cagttctact accgccatta gtgaaacttt 5340
tcaaatcgcc cagtggagaa gaaaaaggca cagcgatact agcattagcg ggcaaggatg 5400
caactttatc aaccagggtc ctatagataa ccctagcgcc tgggatcatc ctttggacaa 5460
ctctttctgc caaatctagg tccaaaatca cttcattgat accattattg tacaacttga 5520
gcaagttgtc gatcagctcc tcaaattggt cctctgtaac ggatgactca acttgcacat 5580
taacttgaag ctcagtcgat tgagtgaact tgatcaggtt gtgcagctgg tcagcagcat 5640
agggaaacac ggcttttcct accaaactca aggaattatc aaactctgca acacttgcgt 5700
atgcaggtag caagggaaat gtcatacttg aagtcggaca gtgagtgtag tcttgagaaa 5760
ttctgaagcc gtatttttat tatcagtgag tcagtcatca ggagatcctc tacgccggac 5820
gcatcgtggc cgacctgcag gtcggcatca ccggcgccac aggtgcggtt gctggcgcct 5880
atatcgccga catcaccgat ggggaagatc gggctcgcca cttcgggctc atgagcgctt 5940
gtttcggcgt gggtatggtg gcaggccccg tggccggggg actgttgggc gccatctcct 6000
tggacctgca ggggggggg gggaaagcca cgttgtgtct caaaatctct gatgttacat 6060
tgcacaagat aaaaatatat catcatgaac aataaaactg tctgcttaca taaacagtaa 6120
tacaaggggt gttatgagcc atattcaacg ggaaacgtct tgctcaaggc cgcgattaaa 6180
ttccaacatg gatgctgatt tatatgggta taaatgggct cgcgataatg tcgggcaatc 6240
aggtgcgaca atctatcgat tgtatgggaa gcccgatgcg ccagagttgt ttctgaaaca 6300
tggcaaaggt agcgttgcca atgatgttac agatgagatg gtcagactaa actggctgac 6360
ggaatttatg cctcttccga ccatcaagca ttttatccgt actcctgatg atgcatggtt 6420
actcaccact gcgatccccg ggaaaacagc attccaggta ttagaagaat atcctgattc 6480
aggtgaaaat attgttgatg cgctggcagt gttcctgcgc cggttgcatt cgattcctgt 6540
ttgtaattgt cctttttaaca gcgatcgcgt atttcgtctc gctcaggcgc aatcacgaat 6600
gaataacggt ttggttgatg cgagtgattt tgatgacgag cgtaatggct ggcctgttga 6660
acaagtctgg aaagaaatgc ataagctttt gccattctca ccggattcag tcgtcactca 6720
tggtgatttc tcacttgata accttatttt tgacgagggg aaattaatag gttgtattga 6780
tgttggacga gtcggaatcg cagaccgata ccaggatctt gccatcctat ggaactgcct 6840
cggtgagttt tctccttcat tacagaaacg ctttttcaa aaatatggta ttgataatcc 6900
tgatatgaat aaaattgcagt ttcatttgat gctcgatgag ttttctaat cagaattggt 6960
taattggttg taacactggc agagcattac gctgacttga cgggacggcg gctttgttga 7020
ataaatcgaa cttttgctga gttgaaggat cagatcacgc atcttcccga caacgcagac 7080
cgttccgtgg caaagcaaaa gttcaaaatc accaactggt ccacctacaa caaagctctc 7140
atcaaccgtg gctccctcac tttctggctg gatgatgggg cgattcaggc ctggtatgag 7200
tcagcaacac cttcttcacg aggcagacct cagcgccccc ccccccctgc aggtcccacg 7260
gcgcggtgc tcaacggcct caacctacta ctgggctgct tcctaatgca ggagtcgcat 7320
aagggagagc gtcgagtatc tatgattgga agtatgggaa tggtgatacc cgcattcttc 7380
```

```
agtgtcttga ggtctcctat cagattatgc ccaactaaag caaccggagg aggagatttc 7440
atggtaaatt tctctgactt ttggtcatca gtagactcga actgtgagac tatctcggtt 7500
atgacagcag aaatgtcctt cttggagaca gtaaatgaag tcccaccaat aaagaaatcc 7560
ttgttatcag gaacaaactt cttgtttcga acttttttcgg tgccttgaac tataaaatgt 7620
agagtggata tgtcgggtag gaatggagcg ggcaaatgct taccttctgg accttcaaga 7680
ggtatgtagg gtttgtagat actgatgcca acttcagtga caacgttgct atttcgttca 7740
aaccattccg aatccagaga aatcaaagtt gtttgtctac tattgatcca agccagtgcg 7800
gtcttgaaac tgacaatagt gtgctcgtgt tttgaggtca tctttgtatg aataaatcta 7860
gtctttgatc taaataatct tgacgagcca aggcgataaa tacccaaatc taaaactctt 7920
ttaaaacgtt aaaaggacaa gtatgtctgc ctgtattaaa ccccaaatca gctcgtagtc 7980
tgatcctcat caacttgagg ggcactatct tgttttagag aaatttgcgg agatgcgata 8040
tcgagaaaaa ggtacgctga ttttaaacgt gaaatttatc tcaagatctc tgcctcgcgc 8100
gtttcggtga tgacggtgaa aacctctgac acatgcagct cccggagacg gtcacagctt 8160
gtctgtaagc ggatgccggg agcagacaag cccgtcaggg cgcgtcagcg ggtgttggcg 8220
ggtgtcgggg cgcagccatg acccagtcac gtagcgatag cggagtgtat actggcttaa 8280
ctatgcggca tcagagcaga ttgtactgag agtgcaccat atgcggtgtg aaataccgca 8340
cagatgcgta aggagaaaat accgcatcag gcgctcttcc gcttcctcgc tcactgactc 8400
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 8460
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 8520
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gcccccctga 8580
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga acccgacag gactataaag 8640
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 8700
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc aatgctcacg 8760
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 8820
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 8880
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 8940
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaaggac 9000
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 9060
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 9120
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 9180
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 9240
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 9300
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 9360
atttcgttca tccatagttg cctgactccc cgtcgtgtag ataactacga tacgggaggg 9420
cttaccatct ggccccagtg ctgcaatgat accgcgagac ccacgctcac cggctccaga 9480
tttatcagca ataaaccagc cagccggaag ggccgagcgc agaagtggtc ctgcaacttt 9540
atccgcctcc atccagtcta ttaattgttg ccgggaagct agagtaagta gttcgccagt 9600
taatagtttg cgcaacgttg ttgccattgc tgcaggcatc gtggtgtcac gctcgtcgtt 9660
tggtatggct tcattcagct ccggttccca acgatcaagg cgagttacat gatcccccat 9720
gttgtgcaaa aaagcggtta gctccttcgg tcctccgatc gttgtcagaa gtaagttggc 9780
cgcagtgtta tcactcatgg ttatggcagc actgcataat tctcttactg tcatgccatc 9840
cgtaagatgc ttttctgtga ctggtgagta ctcaaccaag tcattctgag aatagtgtat 9900
gcggcgaccg agttgctctt gcccggcgtc aacacgggat aataccgcgc cacatagcag 9960
aactttaaaa gtgctcatca ttggaaaacg ttcttcggggg cgaaaactct caaggatctt 10020
accgctgttg agatccagtt cgatgtaacc cactcgtgca cccaactgat cttcagcatc 10080
ttttactttc accagcgttt ctgggtgagc aaaaacagga aggcaaaatg ccgcaaaaaa 10140
gggaataagg gcgacacgga aatgttgaat actcatactc ttcctttttc aatattattg 10200
aagcatttat cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa 10260
taaacaaata ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac 10320
cattattatc atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtcttca 10380
agaattaatt ctcatgtttg acagcttatc atcgataagc tgactcatgt tggtattgtg 10440
aaatagacgc agatcgggaa cactgaaaaa taacagttat tattcgagat c         10491
```

<210> 33
<211> 10512
<212> DNA

<400> 33
```
gatctaacat ccaaagacga aaggttgaat gaaacctttt tgccatccga catccacagg 60
tccattctca cacataagtg ccaaacgcaa caggagggga tacactagca gcagaccgtt 120
gcaaacgcag gacctccact cctcttctcc tcaacaccca cttttgccat cgaaaaacca 180
gcccagttat tgggcttgat tggagctcgc tcattccaat tccttctatt aggctactaa 240
caccatgact ttattagcct gtctatcctg gcccccctgg cgaggttcat gtttgtttat 300
ttccgaatgc aacaagctcc gcattacacc cgaacatcac tccagatgag ggctttctga 360
gtgtggggtc aaatagtttc atgttcccca aatggcccaa aactgacagt ttaaacgctg 420
tcttggaacc taatatgaca aaagcgtgat ctcatccaag atgaactaag tttggttcgt 480
tgaaatgcta acggccagtt ggtcaaaaag aaacttccaa aagtcgccat accgtttgtc 540
ttgtttggta ttgattgacg aatgctcaaa aataatctca ttaatgctta gcgcagtctc 600
tctatcgctt ctgaaccccg gtgcacctgt gccgaaacgc aaatggggaa acacccgctt 660
tttggatgat tatgcattgt ctccacattg tatgcttcca agattctggt gggaatactg 720
ctgatagcct aacgttcatg atcaaaattt aactgttcta acccctactt gacagcaata 780
tataaacaga aggaagctgc cctgtcttaa accttttttt ttatcatcat tattagctta 840
ctttcataat tgcgactggt tccaattgac aagcttttga ttttaacgac ttttaacgac 900
aacttgagaa gatcaaaaaa caactaatta ttcgaaggat ccaaacgatg agatttcctt 960
caatttttac tgcagtttta ttcgcagcat cctccgcatt agctgctcca gtcaacacta 1020
caacagaaga tgaaacggca caaattccgg ctgaagctgt catcggttac tcagatttag 1080
aaggggattt cgatgttgct gttttgccat tttccaacag cacaaataac gggttattgt 1140
ttataaatac tactattgcc agcattgctg ctaaagaaga aggggtatct ctcgagaaaa 1200
gatgcggacc gggcaggggg ttcgggaaga ggaggcaccc caaaaagctg accccttttag 1260
cctacaagca gtttatcccc aatgtggccg agaagaccct aggcgccagc ggaaggtatg 1320
aagggaagat ctccagaaac tccgagcgat ttaaggaact caccccccaat tacaaccccg 1380
acatcatatt taaggatgaa gaaaacaccg gagcggacag gctgatgact cagaggtgta 1440
aggacaagtt gaacgctttg gccatctcgg tgatgaacca gtggccagga gtgaaactgc 1500
gggtgaccga gggctgggac gaagatggcc accactcaga ggagtctctg cactacgagg 1560
gccgcgcagt ggacatcacc acgtctgacc gcgaccgcag caagtacggc atgctggccc 1620
gcctggcggt ggaggccggc ttcgactggg tgtactacga gtccaaggca catatccact 1680
gctcggtgaa agcagagaac tcggtggcgg ccaaatcggg aggcgtcgac cccagagggc 1740
ccacaatcaa gccctgtcct ccatgcaaat gcccagcacc taacctcttg ggtggaccat 1800
ccgtcttcat cttccctcca aagatcaagg atgtactcat gatctccctg agccccatag 1860
tcacatgtgt ggtggtggat gtgagcgagg atgacccaga tgtccagatc agctggtttg 1920
tgaacaacgt ggaagtacac acagctcaga cacaaaccca tagagaggat taccaaagta 1980
cacttcgggt ggtcagtgcc ctccccatcc agcaccagga ctggatgagt ggcaaggagt 2040
tcaaatgcaa ggtcaacaac aaagacctcc cagcgcccat cgagagaacc atctcaaaac 2100
ccaaagggtc agtaagagct ccacaggtat atgtcttgcc tccaccagaa gaagagatga 2160
ctaagaaaca ggtcactctg acctgcatgg tgacagactt catgcctgaa gacatttacg 2220
tggagtggac caacaacggg aaaacagagc taaactacaa gaacactgaa ccagtcctgg 2280
actctgatgg ttcttacttc atgtacagca agctgagagt ggaaaagaag aactgggtgg 2340
aaagaaatag ctactcctgt tcagtggtcc acgagggtct gcacaatcac cacacgacta 2400
agagcttctc ccggactccg ggtaaatgag ctcagatcga ttccatggat cctcacatcc 2460
caatccgcgg ccgcgaatta attcgcctta gacatgactg ttcctcagtt caagttgggc 2520
acttacgaga agaccggtct tgctagattc taatcaagag gatgtcagaa tgccatttgc 2580
ctgagagatg caggcttcat tttttgatact tttttatttg taacctatat agtataggat 2640
tttttttgtc attttgtttc ttctcgtacg agcttgctcc tgatcagcct atctcgcagc 2700
tgatgaatat cttgtggtag gggtttggga aaatcattcg agtttgatgt ttttcttggt 2760
atttcccact cctcttcaga gtacagaaga ttaagtgaga agttcgtttg tgcaagctta 2820
tcgataagct ttaatgcggt agtttatcac agttaaattg ctaacgcagt caggcaccgt 2880
gtatgaaatc taacaatgcg ctcatcgtca tcctcggcac cgtcaccctg gatgctgtag 2940
gcataggctt ggttatgccg gtactccgg gcctcttgcg ggatatcgtc cattccgaca 3000
gcatcgccag tcactatggc gtgctgctag cgctatatgc gttgatgcaa tttctatgcg 3060
cacccgttct cggagcactg tccgaccgct ttggccgccg cccagtcctg ctcgcttcgc 3120
tacttggagc cactatcgac tacgcgatca tggcgaccac acccgtcctg tggatctatc 3180
gaatctaaat gtaagttaaa atctctaaat aattaaataa gtcccagttt ctccatacga 3240
```

```
accttaacag cattgcggtg agcatctaga ccttcaacag cagccagatc catcactgct 3300
tggccaatat gtttcagtcc ctcaggagtt acgtcttgtg aagtgatgaa cttctggaag 3360
gttgcagtgt taactccgct gtattgacgg gcatatccgt acgttggcaa agtgtggttg 3420
gtaccggagg agtaatctcc acaactctct ggagagtagg caccaacaaa cacagatcca 3480
gcgtgttgta cttgatcaac ataagaagaa gcattctcga tttgcaggat caagtgttca 3540
ggagcgtact gattggacat ttccaaagcc tgctcgtagg ttgcaaccga tagggttgta 3600
gagtgtgcaa tacacttgcg tacaatttca acccttggca actgcacagc ttggttgtga 3660
acagcatctt caattctggc aagctccttg tctgtcatat cgacagccaa cagaatcacc 3720
tgggaatcaa taccatgttc agcttgagca gaaggtctga ggcaacgaaa tctggatcag 3780
cgtatttatc agcaataact agaacttcag aaggcccagc aggcatgtca atactacaca 3840
gggctgatgt gtcattttga accatcatct tggcagcagt aacgaactgg tttcctggac 3900
caaatatttt gtcacactta ggaacagttt ctgttccgta agccatagca gctactgcct 3960
gggcgcctcc tgctagcacg atacacttag caccaacctt gtgggcaacg tagatgactt 4020
ctggggtaag ggtaccatcc ttcttaggtg gagatgcaaa aacaatttct ttgcaaccag 4080
caactttggc aggaacaccc agcatcaggg aagtggaagg cagaattgcg gttccaccag 4140
gaatatagag gccaactttc tcaataggtc ttgcaaaacg agagcagact acaccaggc 4200
aagtctcaac ttgcaacgtc tccgttagtt gagcttcatg gaatttcctg acgttatcta 4260
tagagagatc aatggctctc ttaacgttat ctggcaattg cataagttcc tctgggaaag 4320
gagcttctaa cacaggtgtc ttcaaagcga ctccatcaaa cttggcagtt agttctaaaa 4380
gggctttgtc accattttga cgaacattgt cgacaattgg tttgactaat tccataatct 4440
gttccgtttt ctggatagga cgacgaaggg catcttcaat ttcttgtgag gaggccttag 4500
aaacgtcaat tttgcacaat tcaatacgac cttcagaagg gacttcttta ggtttggatt 4560
cttctttagg ttgttccttg gtgtatcctg gcttggcatc tcctttcctt ctagtgacct 4620
ttagggactt catatccagg tttctctcca cctcgtccaa cgtcacaccg tacttggcac 4680
atctaactaa tgcaaaataa aataagtcag cacattccca ggctatatct tccttggatt 4740
tagcttctgc aagttcatca gcttcctccc taatttttagc gttcaaacaa aacttcgtcg 4800
tcaaataacc gtttggtata agaaccttct ggagcattgc tcttacgatc ccacaaggtg 4860
cttccatggc tctaagaccc tttgattggc caaaacagga agtgcgttcc aagtgacaga 4920
aaccaacacc tgtttgttca accacaaatt tcaagcagtc tccatcacaa tccaattcga 4980
tacccagcaa cttttgagtt cgtccagatg tagcacctt ataccacaaa ccgtgacgac 5040
gagattggta gactccagtt tgtgtcctta tagcctccgg aatagacttt ttggacgagt 5100
acaccaggcc caacgagtaa ttagaagagt cagccaccaa agtagtgaat agaccatcgg 5160
ggcggtcagt agtcaaagac gccaacaaaa tttcactgac agggaacttt ttgacatctt 5220
cagaaagttc gtattcagta gtcaattgcc gagcatcaat aatgggggatt ataccagaag 5280
caacagtgga agtcacatct accaactttg cggtctcaga aaaagcataa acagttctac 5340
taccgccatt agtgaaactt ttcaaatcgc ccagtggaga agaaaaaggc acagcgatac 5400
tagcattagc gggcaaggat gcaactttat caaccagggt cctatagata accctagcgc 5460
ctgggatcat cctttggaca actctttctg ccaaatctag gtccaaaatc acttcattga 5520
taccattatt gtacaacttg agcaagttgt cgatcagctc ctcaaattgg tcctctgtaa 5580
cggatgactc aacttgcaca ttaacttgaa gctcagtcga ttgagtgaac ttgatcaggt 5640
tgtgcagctg gtcagcagca tagggaaaca cggcttttcc taccaaactc aaggaattat 5700
caaactctgc aacacttgcg tatgcaggta gcaagggaaa tgtcatactt gaagtcggac 5760
agtgagtgta gtcttgagaa attctgaagc cgtattttta ttatcagtga gtcagtcatc 5820
aggagatcct ctacgccgga cgcatcgtgg ccgacctgca ggtcggcatc accggcgcca 5880
caggtgcggt tgctggcgcc tatatcgccg acatcaccga tggggaagat cgggctcgcc 5940
acttcgggct catgagcgct tgtttcggcg tgggtatggt ggcaggcccc gtggccgggg 6000
gactgttggg cgccatctcc ttggacctgc aggggggggg gggaaagcc acgttgtgtc 6060
tcaaaatctc tgatgttaca ttgcacaaga taaaaatata tcatcatgaa caataaaact 6120
gtctgcttac ataaacagta atacaagggg tgttatgagc catattcaac gggaaacgtc 6180
ttgctcaagg ccgcgattaa attccaacat ggatgctgat ttatatgggt ataaatgggc 6240
tcgcgataat gtcgggcaat caggtgcgac aatctatcga ttgtatggga gcccgatgc 6300
gccagagttg tttctgaaac atggcaaagg tagcgttgcc aatgatgtta cagatgagat 6360
ggtcagacta aactggctga cggaatttat gcctcttccg accatcaagc attttatccg 6420
tactcctgat gatgcatggt tactcaccac tgcgatcccc gggaaaacag cattccaggt 6480
attagaagaa tatcctgatt caggtgaaaa tattgttgat gcgctggcag tgttcctgcg 6540
ccggttgcat tcgattcctg tttgtaattg tcctttttaac agcgatcgcg tatttcgtct 6600
cgctcaggcg caatcacgaa tgaataacgg tttggttgat gcgagtgatt ttgatgacga 6660
```

```
gcgtaatggc tggcctgttg aacaagtctg gaaagaaatg cataagcttt tgccattctc 6720
accggattca gtcgtcactc atggtgattt ctcacttgat aaccttattt ttgacgaggg 6780
gaaattaata ggttgtattg atgttggacg agtcggaatc gcagaccgat accaggatct 6840
tgccatccta tggaactgcc tcggtgagtt ttctccttca ttacagaaac ggctttttca 6900
aaaatatggt attgataatc ctgatatgaa taaattgcag tttcatttga tgctcgatga 6960
gttttctaa tcagaattgg ttaattggtt gtaacactgg cagagcatta cgctgacttg 7020
acgggacggc ggctttgttg aataaatcga acttttgctg agttgaagga tcagatcacg 7080
catcttcccg acaacgcaga ccgttccgtg gcaaagcaaa agttcaaaat caccaactgg 7140
tccacctaca acaaagctct catcaaccgt ggctccctca ctttctggct ggatgatggg 7200
gcgattcagg cctggtatga gtcagcaaca ccttcttcac gaggcagacc tcagcgcccc 7260
ccccccctg caggtcccac ggcggcggtg ctcaacggcc tcaacctact actgggctgc 7320
ttcctaatgc aggagtcgca taagggagag cgtcgagtat ctatgattgg aagtatggga 7380
atggtgatac ccgcattctt cagtgtcttg aggtctccta tcagattatg cccaactaaa 7440
gcaaccggag gaggagattt catggtaaat ttctctgact tttggtcatc agtagactcg 7500
aactgtgaga ctatctcggt tatgacagca gaaatgtcct tcttggagac agtaaatgaa 7560
gtcccaccaa taaagaaatc cttgttatca ggaacaaact tcttgtttcg aacttttтcg 7620
gtgccttgaa ctataaaatg tagagtggat atgtcgggta ggaatggagc gggcaaatgc 7680
ttaccttctg gaccttcaag aggtatgtag ggtttgtaga tactgatgcc aacttcagtg 7740
acaacgttgc tatttcgttc aaaccattcc gaatccagag aaatcaaagt tgtttgtcta 7800
ctattgatcc aagccagtgc ggtcttgaaa ctgacaatag tgtgctcgtg ttttgaggtc 7860
atctttgtat gaataaatct agtctttgat ctaaataatc ttgacgagcc aaggcgataa 7920
atacccaaat ctaaaactct tttaaaacgt taaaaggaca agtatgtctg cctgtattaa 7980
accccaaatc agctcgtagt ctgatcctca tcaacttgag gggcactatc ttgttttaga 8040
gaaatttgcg gagatgcgat atcgagaaaa aggtacgctg atttttaaacg tgaaatttat 8100
ctcaagatct ctgcctcgcg cgtttcggtg atgacggtga aaacctctga cacatgcagc 8160
tcccggagac ggtcacagct tgtctgtaag cggatgccgg gagcagacaa gcccgtcagg 8220
gcgcgtcagc gggtgttggc gggtgtcggg gcgcagccat gacccagtca cgtagcgata 8280
gcggagtgta tactggctta actatgcggc atcagagcag attgtactga gagtgcacca 8340
tatgcggtgt gaaataccgc acagatgcgt aaggagaaaa taccgcatca ggcgctcttc 8400
cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc 8460
tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag aaagaacat 8520
gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt 8580
ccataggctc cgcccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg 8640
aaacccgaca ggactataaa gataccaggc gtttccccct ggaagctccc tcgtgcgctc 8700
tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt 8760
ggcgctttct caatgctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa 8820
gctgggctgt gtgcacgaac cccccgttca gcccgaccgc tgcgccttat ccggtaacta 8880
tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa 8940
caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa 9000
ctacggctac actagaagga cagtatttgg tatctgcgct ctgctgaagc cagttacctt 9060
cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt 9120
ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat 9180
cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat 9240
gagattatca aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc 9300
aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc 9360
acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcc ccgtcgtgta 9420
gataactacg atacgggagg gcttaccatc tggccccagt gctgcaatga taccgcgaga 9480
cccacgctca ccggctccag atttatcagc aataaaccag ccagccggaa gggccgagcg 9540
cagaagtggt cctgcaactt tatccgcctc catccagtct attaattgtt gccgggaagc 9600
tagagtaagt agttcgccag ttaatagttt gcgcaacgtt gttgccattg ctgcaggcat 9660
cgtggtgtca cgctcgtcgt ttggtatggc ttcattcagc tccggttccc aacgatcaag 9720
gcgagttaca tgatccccca tgttgtgcaa aaaagcggtt agctccttcg tcctccgat 9780
cgttgtcaga agtaagttgg ccgcagtgtt atcactcatg gttatggcag cactgcataa 9840
ttctcttact gtcatgccat ccgtaagatg cttttctgtg actggtgagt actcaaccaa 9900
gtcattctga gaatagtgta tgcggcgacc gagttgctct gcccggcgt caacacggga 9960
taataccgcg ccacatagca gaactttaaa agtgctcatc attggaaaac gttcttcggg 10020
gcgaaaactc tcaaggatct taccgctgtt gagatccagt tcgatgtaac ccactcgtgc 10080
```

```
acccaactga tcttcagcat ctttttacttt caccagcgtt tctgggtgag caaaaacagg 10140
aaggcaaaat gccgcaaaaa agggaataag ggcgacacgg aaatgttgaa tactcatact 10200
cttccttttt caatattatt gaagcattta tcagggttat tgtctcatga gcggatacat 10260
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 10320
gccacctgac gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat 10380
cacgaggccc tttcgtcttc aagaattaat tctcatgttt gacagcttat catcgataag 10440
ctgactcatg ttggtattgt gaaatagacg cagatcggga acactgaaaa ataacagtta 10500
ttattcgaga tc                                                   10512


<210> 34
<211> 10462
<212> DNA
<213> Plasmid pUB116

<400> 34
gatctaacat ccaaagacga aaggttgaat gaaacctttt tgccatccga catccacagg 60
tccattctca cacataagtg ccaaacgcaa caggagggga tacactagca gcagaccgtt 120
gcaaacgcag gacctccact cctcttctcc tcaacaccca cttttgccat cgaaaaacca 180
gcccagttat tgggcttgat tggagctcgc tcattccaat tccttctatt aggctactaa 240
caccatgact ttattagcct gtctatcctg gcccccctgg cgaggttcat gtttgtttat 300
ttccgaatgc aacaagctcc gcattacacc cgaacatcac tccagatgag ggctttctga 360
gtgtgggggtc aaatagtttc atgttcccca aatggcccaa aactgacagt ttaaacgctg 420
tcttggaacc taatatgaca aaagcgtgat ctcatccaag atgaactaag tttggttcgt 480
tgaaatgcta acggccagtt ggtcaaaaag aaacttccaa aagtcgccat accgtttgtc 540
ttgtttggta ttgattgacg aatgctcaaa ataatctca ttaatgctta gcgcagtctc 600
tctatcgctt ctgaaccccg gtgcacctgt gccgaaacgc aaatggggaa acacccgctt 660
tttggatgat tatgcattgt ctccacattg tatgcttcca agattctggt gggaatactg 720
ctgatagcct aacgttcatg atcaaaattt aactgttcta acccctactt gacagcaata 780
tataaacaga aggaagctgc cctgtcttaa accttttttt ttatcatcat tattagctta 840
ctttcataat tgcgactggt tccaattgac aagcttttga ttttaacgac ttttaacgac 900
aacttgagaa gatcaaaaaa caactaatta ttcgaaggat ccaaacgatg agatttcctt 960
caatttttac tgcagtttta ttcgcagcat cctccgcatt agctgctcca gtcaacacta 1020
caacagaaga tgaaacggca caaattccgg ctgaagctgt catcggttac tcagatttag 1080
aaggggattt cgatgttgct gttttgccat tttccaacag cacaaataac gggttattgt 1140
ttataaatac tactattgcc agcattgctg ctaaagaaga aggggtatct ctcgagaaaa 1200
gatgcggacc gggcaggggg ttcgggaaga ggaggcaccc caaaaagctg accccttag 1260
cctacaagca gtttatcccc aatgtggccg agaagaccct aggcgccagc ggaaggtatg 1320
aagggaagat ctccagaaac tccgagcgat ttaaggaact cacccccaat tacaaccccg 1380
acatcatatt taaggatgaa gaaaacaccg gagcggacag gctgatgact cagaggtgta 1440
aggacaagtt gaacgctttg gccatctcgg tgatgaacca gtggccagga gtgaaactgc 1500
gggtgaccga gggctgggac gaagatggcc accactcaga ggagtctctg cactacgagg 1560
gccgcgcagt ggacatcacc acgtctgacc gcgaccgcag caagtacggc atgctggccc 1620
gcctggcggt ggaggccggc ttcgactggg tgtactacga gtccaaggca catatccact 1680
gctcggtgaa agcagagaac tcggtggcgg ccaaatcggg aggcgtcgac aaaactcaca 1740
catgcccacc gtgcccagca cctgaactcc tggggggacc gtcagtcttc ctcttccccc 1800
caaaacccaa ggacaccctc atgatctccc ggacccctga ggtcacatgc gtggtggtgg 1860
acgtgagcca cgaagaccct gaggtcaagt tcaactggta cgtggacggc gtggaggtgc 1920
ataatgccaa gacaaagccg cgggaggagc agtaccagag cacgtaccgt gtggtcagcg 1980
tcctcaccgt cctgcaccag gactggctga atggcaagga gtacaagtgc aaggtctcca 2040
acaaagccct cccagccccc atcgagaaaa ccatctccaa agccaaaggg cagccccgag 2100
aaccacaggt gtacaccctg cccccatccc gggatgagct gaccaagaac caggtcagcc 2160
tgacctgcct ggtcaaaggc ttctatccca gcgacatcgc cgtggagtgg gagagcaatg 2220
ggcagccgga gaacaactac aagaccacgc ctcccgtgtt ggactccgac ggctccttct 2280
tcctctacag caagctcacc gtggacaaga gcaggtggca gcagggaac gtcttctcat 2340
gctccgtgat gcatgaggct ctgcacaacc actacacgca gaagagcctc tccctgtctc 2400
cgggaaatg agtgcggcgg ccgcgaatta attcgcctta gacatgactg ttcctcagtt 2460
```

```
caagttgggc acttacgaga agaccggtct tgctagattc taatcaagag gatgtcagaa 2520
tgccatttgc ctgagagatg caggcttcat tttttgatact tttttattttg taacctatat 2580
agtataggat ttttttttgtc attttgtttc ttctcgtacg agcttgctcc tgatcagcct 2640
atctcgcagc tgatgaatat cttgtggtag gggtttggga aaatcattcg agtttgatgt 2700
ttttcttggt attttcccact cctcttcaga gtacagaaga ttaagtgaga agttcgtttg 2760
tgcaagctta tcgataagct ttaatgcggt agtttatcac agttaaattg ctaacgcagt 2820
caggcaccgt gtatgaaatc taacaatgcg ctcatcgtca tcctcggcac cgtcaccctg 2880
gatgctgtag gcataggctt ggttatgccg gtactccgg gcctcttgcg ggatatcgtc 2940
cattccgaca gcatcgccag tcactatggc gtgctgctag cgctatatgc gttgatgcaa 3000
tttctatgcg cacccgttct cggagcactg tccgaccgct ttggccgccg cccagtcctg 3060
ctcgcttcgc tacttggagc cactatcgac tacgcgatca tggcgaccac acccgtcctg 3120
tggatctatc gaatctaaat gtaagttaaa atctctaaat aattaaataa gtcccagttt 3180
ctccatacga accttaacag cattgcggtg agcatctaga ccttcaacag cagccagatc 3240
catcactgct tggccaatat gtttcagtcc ctcaggagtt acgtcttgtg aagtgatgaa 3300
cttctggaag gttgcagtgt taactccgct gtattgacgg gcatatccgt acgttggcaa 3360
agtgtggttg gtaccggagg agtaatctcc acaactctct ggagagtagg caccaacaaa 3420
cacagatcca gcgtgttgta cttgatcaac ataagaagaa gcattctcga tttgcaggat 3480
caagtgttca ggagcgtact gattggacat ttccaaagcc tgctcgtagg ttgcaaccga 3540
tagggttgta gagtgtgcaa tacacttgcg tacaatttca acccttggca actgcacagc 3600
ttggttgtga acagcatctt caattctggc aagctccttg tctgtcatat cgacagccaa 3660
cagaatcacc tgggaatcaa taccatgttc agcttgagca gaaggtctga ggcaacgaaa 3720
tctggatcag cgtatttatc agcaataact agaacttcag aaggcccagc aggcatgtca 3780
atactacaca gggctgatgt gtcattttga accatcatct tggcagcagt aacgaactgg 3840
tttcctggac caaatatttt gtcacactta ggaacagttt ctgttccgta agccatagca 3900
gctactgcct gggcgcctcc tgctagcacg atacacttag caccaacctt gtgggcaacg 3960
tagatgactt ctggggtaag ggtaccatcc ttcttaggtg gagatgcaaa aacaatttct 4020
ttgcaaccag caactttggc aggaacaccc agcatcaggg aagtggaagg cagaattgcg 4080
gttccaccag gaatatagag gccaactttc tcaataggtc ttgcaaaacg agagcagact 4140
acaccagggc aagtctcaac ttgcaacgtc tccgttagtt gagcttcatg gaatttcctg 4200
acgttatcta tagagagatc aatggctctc ttaacgttat ctggcaattg cataagttcc 4260
tctgggaaag gagcttctaa cacaggtgtc ttcaaagcga ctccatcaaa cttggcagtt 4320
agttctaaaa gggctttgtc accattttga cgaacattgt cgacaattgg tttgactaat 4380
tccataatct gttccgtttt ctggatagga cgacgaaggg catcttcaat ttcttgtgag 4440
gaggccttag aaacgtcaat tttgcacaat tcaatacgac cttcagaagg gacttcttta 4500
ggtttggatt cttctttagg ttgttccttg gtgtatcctg gcttggcatc tcctttcctt 4560
ctagtgacct ttagggactt catatccagg tttctctcca cctcgtccaa cgtcacaccg 4620
tacttggcac atctaactaa tgcaaaataa aataagtcag cacattccca ggctatatct 4680
tccttggatt tagcttctgc aagttcatca gcttcctccc taattttagc gttcaaacaa 4740
aacttcgtcg tcaaataacc gtttggtata agaaccttct ggagcattgc tcttacgatc 4800
ccacaaggtg cttccatggc tctaagaccc tttgattggc caaaacagga agtgcgttcc 4860
aagtgacaga aaccaacacc tgtttgttca accacaaatt tcaagcagtc tccatcacaa 4920
tccaattcga tacccagcaa cttttgagtt cgtccagatg tagcaccttt ataccacaaa 4980
ccgtgacgac gagattggta gactccagtt tgtgtcctta tagcctccgg aatagacttt 5040
ttggacgagt acaccaggcc caacgagtaa ttagaagagt cagccaccaa agtagtgaat 5100
agaccatcgg ggcggtcagt agtcaaagac gccaacaaaa tttcactgac agggaacttt 5160
ttgacatctt cagaaagttc gtattcagta gtcaattgcc gagcatcaat aatggggatt 5220
ataccagaag caacagtgga agtcacatct accaactttg cggtctcaga aaaagcataa 5280
acagttctac taccgccatt agtgaaactt ttcaaatcgc ccagtggaga agaaaaaggc 5340
acagcgatac tagcattagc gggcaaggat gcaactttat caaccaggt cctatagata 5400
accctagcgc ctgggatcat cctttggaca actctttctg ccaaatctag gtccaaaatc 5460
acttcattga taccattatt gtacaacttg agcaagttgt cgatcagctc ctcaaattgg 5520
tcctctgtaa cggatgactc aacttgcaca ttaacttgaa gctcagtcga ttgagtgaac 5580
ttgatcaggt tgtgcagctg gtcagcagca tagggaaaca cggcttttcc taccaaactc 5640
aaggaattat caaactctgc aacacttgcg tatgcaggta gcaagggaaa tgtcatactt 5700
gaagtcggac agtgagtgta gtcttgagaa attctgaagc cgtattttta ttatcagtga 5760
gtcagtcatc aggagatcct ctacgccgga cgcatcgtgg ccgacctgca ggtcggcatc 5820
accggcgcca caggtgcggt tgctggcgcc tatatcgccg acatcaccga tggggaagat 5880
```

```
cgggctcgcc acttcgggct catgagcgct tgtttcggcg tgggtatggt ggcaggcccc 5940
gtggccgggg gactgttggg cgccatctcc ttggacctgc aggggggggg ggggaaagcc 6000
acgttgtgtc tcaaaatctc tgatgttaca ttgcacaaga taaaaatata tcatcatgaa 6060
caataaaact gtctgcttac ataaacagta atacaagggg tgttatgagc catattcaac 6120
gggaaacgtc ttgctcaagg ccgcgattaa attccaacat ggatgctgat ttatatgggt 6180
ataaatgggc tcgcgataat gtcgggcaat caggtgcgac aatctatcga ttgtatggga 6240
agcccgatgc gccagagttg tttctgaaac atggcaaagg tagcgttgcc aatgatgtta 6300
cagatgagat ggtcagacta aactggctga cggaatttat gcctcttccg accatcaagc 6360
attttatccg tactcctgat gatgcatggt tactcaccac tgcgatcccc gggaaaacag 6420
cattccaggt attagaagaa tatcctgatt caggtgaaaa tattgttgat gcgctggcag 6480
tgttcctgcg ccggttgcat tcgattcctg tttgtaattg tccttttaac agcgatcgcg 6540
tatttcgtct cgctcaggcg caatcacgaa tgaataacgg tttggttgat gcgagtgatt 6600
ttgatgacga gcgtaatggc tggcctgttg aacaagtctg gaaagaaatg cataagcttt 6660
tgccattctc accggattca gtcgtcactc atggtgattt ctcacttgat aaccttattt 6720
ttgacgaggg gaaattaata ggttgtattg atgttggacg agtcggaatc gcagaccgat 6780
accaggatct tgccatccta tggaactgcc tcggtgagtt ttctccttca ttacagaaac 6840
ggcttttttca aaaatatggt attgataatc ctgatatgaa taaattgcag tttcatttga 6900
tgctcgatga gttttttctaa tcagaattgg ttaattggtt gtaacactgg cagagcatta 6960
cgctgacttg acgggacggc ggctttgttg aataaatcga acttttgctg agttgaagga 7020
tcagatcacg catcttcccg acaacgcaga ccgttccgtg gcaaagcaaa agttcaaaat 7080
caccaactgg tccacctaca acaaagctct catcaaccgt ggctccctca ctttctggct 7140
ggatgatggg gcgattcagg cctggtatga gtcagcaaca ccttcttcac gaggcagacc 7200
tcagcgcccc ccccccctg caggtcccac ggcggcggtg ctcaacggcc tcaacctact 7260
actgggctgc ttcctaatgc aggagtcgca taaggagag cgtcgagtat ctatgattgg 7320
aagtatggga atggtgatac ccgcattctt cagtgtcttg aggtctccta tcagattatg 7380
cccaactaaa gcaaccggag gaggagattt catggtaaat ttctctgact tttggtcatc 7440
agtagactcg aactgtgaga ctatctcggt tatgacagca gaaatgtcct tcttggagac 7500
agtaaatgaa gtcccaccaa taaagaaatc cttgttatca ggaacaaact tcttgtttcg 7560
aacttttcg gtgccttgaa ctataaaatg tagagtggat atgtcgggta ggaatggagc 7620
gggcaaatgc ttaccttctg gaccttcaag aggtatgtag ggtttgtaga tactgatgcc 7680
aacttcagtg acaacgttgc tatttcgttc aaaccattcc gaatccagag aaatcaaagt 7740
tgtttgtcta ctattgatcc aagccagtgc ggtcttgaaa ctgacaatag tgtgctcgtg 7800
ttttgaggtc atctttgtat gaataaatct agtctttgat ctaaataatc ttgacgagcc 7860
aaggcgataa atacccaaat ctaaaactct tttaaaacgt taaaaggaca agtatgtctg 7920
cctgtattaa accccaaatc agctcgtagt ctgatcctca tcaacttgag gggcactatc 7980
ttgtttttaga gaaatttgcg gagatgcgat atcgagaaaa aggtacgctg attttaaacg 8040
tgaaatttat ctcaagatct ctgcctcgcg cgtttcggtg atgacggtga aaacctctga 8100
cacatgcagc tcccggagac ggtcacagct tgtctgtaag cggatgccgg gagcagacaa 8160
gcccgtcagg gcgcgtcagc gggtgttggc gggtgtcggg gcgcagccat gacccagtca 8220
cgtagcgata gcggagtgta tactggctta actatgcggc atcagagcag attgtactga 8280
gagtgcacca tatgcggtgt gaaataccgc acagatgcgt aaggagaaaa taccgcatca 8340
ggcgctcttc cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag 8400
cggtatcagc tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag 8460
gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc 8520
tggcgttttt ccataggctc cgcccccctg acgagcatca caaaaatcga cgctcaagtc 8580
agaggtggcg aaacccgaca ggactataaa gataccaggc gtttcccct ggaagctccc 8640
tcgtgcgctc tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt 8700
cgggaagcgt ggcgctttct caatgctcac gctgtaggta tctcagttcg gtgtaggtcg 8760
ttcgctccaa gctgggctgt gtgcacgaac ccccgttca gcccgaccgc tgcgccttat 8820
ccggtaacta tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag 8880
ccactggtaa caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt 8940
ggtggcctaa ctacggctac actagaagga cagtatttgg tatctgcgct ctgctgaagc 9000
cagttacctt cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta 9060
gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag 9120
atcctttgat cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga 9180
ttttggtcat gagattatca aaaaggatct tcacctagat cctttttaaat taaaaatgaa 9240
gttttaaatc aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa 9300
```

```
tcagtgaggc acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcc 9360
ccgtcgtgta gataactacg atacgggagg gcttaccatc tggccccagt gctgcaatga 9420
taccgcgaga cccacgctca ccggctccag atttatcagc aataaaccag ccagccggaa 9480
gggccgagcg cagaagtggt cctgcaactt tatccgcctc catccagtct attaattgtt 9540
gccgggaagc tagagtaagt agttcgccag ttaatagttt gcgcaacgtt gttgccattg 9600
ctgcaggcat cgtggtgtca cgctcgtcgt ttggtatggc ttcattcagc tccggttccc 9660
aacgatcaag gcgagttaca tgatccccca tgttgtgcaa aaaagcggtt agctccttcg 9720
gtcctccgat cgttgtcaga agtaagttgg ccgcagtgtt atcactcatg gttatggcag 9780
cactgcataa ttctcttact gtcatgccat ccgtaagatg cttttctgtg actggtgagt 9840
actcaaccaa gtcattctga gaatagtgta tgcggcgacc gagttgctct gcccggcgt 9900
caacacggga taataccgcg ccacatagca gaactttaaa agtgctcatc attggaaaac 9960
gttcttcggg gcgaaaactc tcaaggatct taccgctgtt gagatccagt tcgatgtaac 10020
ccactcgtgc acccaactga tcttcagcat cttttacttt caccagcgtt tctgggtgag 10080
caaaaacagg aaggcaaaat gccgcaaaaa agggaataag ggcgacacgg aaatgttgaa 10140
tactcatact cttccttttt caatattatt gaagcattta tcaggttat tgtctcatga 10200
gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc 10260
cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta acctataaaa 10320
ataggcgtat cacgaggccc tttcgtcttc aagaattaat tctcatgttt gacagcttat 10380
catcgataag ctgactcatg ttggtattgt gaaatagacg cagatcggga acactgaaaa 10440
ataacagtta ttattcgaga tc                                          10462
```

<210> 35
<211> 4205
<212> DNA
<213> Plasmid pEAG657

<400> 35
```
ctaaattgta agcgttaata ttttgttaaa attcgcgtta aattttgtt aaatcagctc 60
atttttaac caataggccg aaatcggcaa aatcccttat aaatcaaaag aatagaccga 120
gatagggttg agtgttgttc cagtttggaa caagagtcca ctattaaaga acgtggactc 180
caacgtcaaa gggcgaaaaa ccgtctatca gggcgatggc ccactacgtg aaccatcacc 240
ctaatcaagt tttttggggt cgaggtgccg taaagcacta atcggaacc ctaaagggag 300
cccccgattt agagcttgac ggggaaagcc ggcgaacgtg gcgagaaagg aagggaagaa 360
agcgaaagga gcgggcgcta gggcgctggc aagtgtagcg gtcacgctgc gcgtaaccac 420
cacacccgcc gcgcttaatg cgccgctaca gggcgcgtcc cattcgccat tcaggctgcg 480
caactgttgg gaagggcgat cggtgcgggc ctcttcgcta ttacgccagc tggcgaaagg 540
gggatgtgct gcaaggcgat taagttgggt aacgccaggg ttttcccagt cacgacgttg 600
taaaacgacg gccagtgagc gcgcgtaata cgactcacta tagggcgaat tgggtaccgg 660
gccctctaga tcctttcagc tccctgcccc ggacatgccc agtgggtgga agctgccctc 720
ttctagcagg agacgcccca ggcggtagag cagctggggg taccaatgca caccctcccc 780
cggagtccag ctgccccatg ccaagctgtg aaagagtctc aggggccaga aggccaactg 840
agccaggtgg tggtcagcca cggccgcgaa gcaggatgcc accacatcct ccaccaccag 900
tgtcccatgc tttgtgagcg gggcgtaggc cccgagggcc acgtgtgtag agacagctgc 960
cacgcgggca ggctgcaggc ctggcacccc agccaccagc acgtactggc caggctgcac 1020
gtggctggca aatgtggccc ggaagcgggc tgccggctcc gtgtgattgt cagccgtaaa 1080
gagcaggtga gcgggtgtga gtgccaggcg gcgtgggggg tcctgagtct cgatgacctg 1140
gaaggctctc agcctgtggg gctcgcggtc caggaaaatg agcacatcgc tgaaggtggg 1200
gctcccatcc tcccccatgg ccagcacacg gtctcccggc ctcacggctg acaaggccac 1260
acgcgcccca ctctccaggc gtacctgggc tgcggccgcg aatcagccgc ccgtcttggc 1320
tgcggccgag tgctcggact tgacggagca atgcacgtgg gcctttgact cgtaatacac 1380
ccagtcaaag ccggcctcca ctgccaagcg cgccagcagt ccatacttat tgcggtcgcg 1440
gtctgatgtg gtgatgtcca ccgcgcggcc ctcataatgc agggactcct ctgagtggtg 1500
gccgtcctcg tcccagccct cggtcacccg cagcttcaca ccgggccact ggttcatcac 1560
cgagatagcc agcgagttca ggcggtcctt gcagcgctgg gtcatgaggc ggtcggcgcc 1620
tgtgttctcc tcgtccttga agatgatgtc tggattgtaa ttgggggtga gctccttgaa 1680
gcgctcggag ctgcgagcga tcttgccttc atagcgtccg ctggcgccca gggtcttctc 1740
```

```
gggcacattg gggctgaact gcttgtaggc gagcggcacg agtttgcgtg gcggtcgccg 1800
gcggctgccc accacccgac ccggcccgca gccccatgcc gccggcacca ccagcagcag 1860
caacaggacc aggcagaagt gcagtcgggg ccggagccgg gcgggagaca tggcggccgc 1920
gacggtatcg ataagcttga tatcgaattc ctgcagcccg ggggatccac tagttctaga 1980
gcggccgcca ccgcggtgga gctccagctt ttgttccctt tagtgagggt taattgcgcg 2040
cttggcgtaa tcatggtcat agctgtttcc tgtgtgaaat tgttatccgc tcacaattcc 2100
acacaacata cgagccggaa gcataaagtg taaagcctgg ggtgcctaat gagtgagcta 2160
actcacatta attgcgttgc gctcactgcc cgctttccag tcgggaaacc tgtcgtgcca 2220
gctgcattaa tgaatcggcc aacgcgcggg gagaggcggt ttgcgtattg ggcgctcttc 2280
cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc 2340
tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat 2400
gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt 2460
ccataggctc cgcccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg 2520
aaacccgaca ggactataaa gataccaggc gtttccccct ggaagctccc tcgtgcgctc 2580
tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt 2640
ggcgctttct catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa 2700
gctgggctgt gtgcacgaac cccccgttca gcccgaccgc tgcgccttat ccggtaacta 2760
tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa 2820
caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa 2880
ctacggctac actagaagga cagtatttgg tatctgcgct ctgctgaagc cagttacctt 2940
cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt 3000
ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat 3060
cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat 3120
gagattatca aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc 3180
aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc 3240
acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcc ccgtcgtgta 3300
gataactacg atacgggagg gcttaccatc tggccccagt gctgcaatga taccgcgaga 3360
cccacgctca ccggctccag atttatcagc aataaaccag ccagccggaa gggccgagcg 3420
cagaagtggt cctgcaactt tatccgcctc catccagtct attaattgtt gccgggaagc 3480
tagagtaagt agttcgccag ttaatagttt gcgcaacgtt gttgccattg ctacaggcat 3540
cgtggtgtca cgctcgtcgt ttggtatggc ttcattcagc tccggttccc aacgatcaag 3600
gcgagttaca tgatccccca tgttgtgcaa aaaagcggtt agctccttcg gtcctccgat 3660
cgttgtcaga agtaagttgg ccgcagtgtt atcactcatg gttatggcag cactgcataa 3720
ttctcttact gtcatgccat ccgtaagatg cttttctgtg actggtgacg cgtcaaccaa 3780
gtcattctga gaatagtgta tgcggcgacc gagttgctct gcccggcgt caatacggga 3840
taataccgcg ccacatagca gaactttaaa agtgctcatc attggaaaac gttcttcggg 3900
gcgaaaactc tcaaggatct taccgctgtt gagatccagt tcgatgtaac ccactcgtgc 3960
acccaactga tcttcagcat ctttttacttt caccagcgtt tctgggtgag caaaaacagg 4020
aaggcaaaat gccgcaaaaa agggaataag ggcgacacgg aaatgttgaa tactcatact 4080
cttccttttt caatattatt gaagcattta tcaggttat tgtctcatga gcggatacat 4140
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 4200
gccac                                                             4205
```

<210> 36
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
    Oligonucleotide

<400> 36
```
tcgagaaaag atgcggaccg ggcaggggt                                        30
```

```
<210> 37
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:
      Oligonucleotide

<400> 37
cgaaccccct gcccggtccg catcttttc                                    29


<210> 38
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 38
tcaggatgca tttgacagtg actgg                                        25


<210> 39
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 39
actccgagtc ggaggaatca gaccc                                        25


<210> 40
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 40
cgaagtggtg aagttcatgg atg                                          23


<210> 41
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer
```

<400> 41
ttctgtatca gtctttcctg gtgag   25

<210> 42
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 42
tacaacttca agcagaagag   20

<210> 43
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 43
cagctcttag cagacattgg   20

<210> 44
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 44
caacacaaac gctctgcaga gaga   24

<210> 45
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 45
ctccagttgc tgcttctgaa ggac   24

<210> 46
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 46
agcgacgtga ggatggcagc gtt   23

<210> 47
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 47
atttcctggt tggctgatgc tgctt   25

<210> 48
<211> 4205
<212> DNA
<213> Plasmid pEAG658

<400> 48
ctaaattgta agcgttaata ttttgttaaa attcgcgtta aatttttgtt aaatcagctc 60
atttttttaac caataggccg aaatcggcaa aatcccttat aaatcaaaag aatagaccga 120
gatagggttg agtgttgttc cagtttggaa caagagtcca ctattaaaga acgtggactc 180
caacgtcaaa gggcgaaaaa ccgtctatca gggcgatggc ccactacgtg aaccatcacc 240
ctaatcaagt tttttggggt cgaggtgccg taaagcacta aatcggaacc ctaaagggag 300
cccccgattt agagcttgac ggggaaagcc ggcgaacgtg cgagaaagg aagggaagaa 360
agcgaaagga gcgggcgcta gggcgctggc aagtgtagcg gtcacgctgc gcgtaaccac 420
cacacccgcc gcgcttaatg cgccgctaca gggcgcgtcc cattcgccat tcaggctgcg 480
caactgttgg gaagggcgat cggtgcgggc ctcttcgcta ttacgccagc tggcgaaagg 540
gggatgtgct gcaaggcgat taagttgggt aacgccaggg ttttcccagt cacgacgttg 600
taaaacgacg gccagtgagc gcgcgtaata cgactcacta tagggcgaat tgggtaccgg 660
gccctctaga tcctttcagc tccctgcccc ggacatgccc agtgggtgga agctgccctc 720
ttctagcagg agacgcccca ggcggtagag cagctggggg taccaatgca caccctcccc 780
cggagtccag ctgccccatg ccaagctgtg aaagagtctc aggggccaga aggccaactg 840
agccaggtgg tggtcagcca cggccgcgaa gcaggatgcc accacatcct ccaccaccag 900
tgtcccatgc tttgtgagcg gggcgtaggc cccgagggcc acgtgtgtag agacagctgc 960
cacgcgggca ggctgcaggc ctggcacccc agccaccagc acgtactggc caggctgcac 1020
gtggctggca aatgtggccc ggaagcgggc tgccggctcc gtgtgattgt cagccgtaaa 1080
gagcaggtga gcgggtgtga gtgccaggcg cgtggggggg tcctgagtct cgatgacctg 1140
gaaggctctc agcctgtggg gctcgcggtc caggaaaatg agcacatcgc tgaaggtggg 1200
gctcccatcc tcccccatgg ccagcacacg gtctcccggc ctcacggctg acaaggccac 1260
acgcgcccca ctctccaggc gtacctgggc tccggcaggg tcgacgccgc ccgtcttggc 1320
tgcggccgag tgctcggact tgacggagca atgcacgtgg gcctttgact cgtaatacac 1380
ccagtcaaag ccggcctcca ctgccaagcg cgccagcagt ccatacttat tgcggtcgcg 1440
gtctgatgtg gtgatgtcca ccgcgcggcc ctcataatgc agggactcct ctgagtggtg 1500
gccgtcctcg tcccagccct cggtcacccg cagcttcaca ccgggccact ggttcatcac 1560
cgagatagcc agcgagttca ggcggtcctt gcagcgctgg gtcatgaggc ggtcggcgcc 1620
tgtgttctcc tcgtccttga agatgatgtc tggattgtaa ttgggggtga gctccttgaa 1680
gcgctcggag ctgcgagcga tcttgccttc atagcgtccg ctggcgccca gggtcttctc 1740
gggcacattg gggctgaact gcttgtaggc gagcggcacg agtttgcgtg gcggtcgccg 1800
gcggctgccc accacccgac ccggcccgca gccccatgcc gccggcacca ccagcagcag 1860
caacaggacc aggcagaagt gcagtcgggg ccggagccgg gcgggagaca tggcggccgc 1920

```
gacggtatcg ataagcttga tatcgaattc ctgcagcccg ggggatccac tagttctaga 1980
gcggccgcca ccgcggtgga gctccagctt ttgttccctt tagtgagggt taattgcgcg 2040
cttggcgtaa tcatggtcat agctgtttcc tgtgtgaaat tgttatccgc tcacaattcc 2100
acacaacata cgagccggaa gcataaagtg taaagcctgg ggtgcctaat gagtgagcta 2160
actcacatta attgcgttgc gctcactgcc cgctttccag tcgggaaacc tgtcgtgcca 2220
gctgcattaa tgaatcggcc aacgcgcggg gagaggcggt ttgcgtattg ggcgctcttc 2280
cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc 2340
tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat 2400
gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt 2460
ccataggctc cgcccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg 2520
aaacccgaca ggactataaa gataccaggc gtttccccct ggaagctccc tcgtgcgctc 2580
tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt 2640
ggcgctttct catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa 2700
gctgggctgt gtgcacgaac cccccgttca gcccgaccgc tgcgccttat ccggtaacta 2760
tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa 2820
caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa 2880
ctacggctac actagaagga cagtatttgg tatctgcgct ctgctgaagc cagttacctt 2940
cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt 3000
ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat 3060
cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat 3120
gagattatca aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc 3180
aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc 3240
acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcc ccgtcgtgta 3300
gataactacg atacgggagg gcttaccatc tggccccagt gctgcaatga taccgcgaga 3360
cccacgctca ccggctccag atttatcagc aataaaccag ccagccggaa gggccgagcg 3420
cagaagtggt cctgcaactt tatccgcctc catccagtct attaattgtt gccgggaagc 3480
tagagtaagt agttcgccag ttaatagttt gcgcaacgtt gttgccattg ctacaggcat 3540
cgtggtgtca cgctcgtcgt ttggtatggc ttcattcagc tccggttccc aacgatcaag 3600
gcgagttaca tgatccccca tgttgtgcaa aaaagcggtt agctccttcg gtcctccgat 3660
cgttgtcaga agtaagttgg ccgcagtgtt atcactcatg gttatggcag cactgcataa 3720
ttctcttact gtcatgccat ccgtaagatg cttttctgtg actggtgacg cgtcaaccaa 3780
gtcattctga gaatagtgta tgcggcgacc gagttgctct gcccggcgt caatacggga 3840
taataccgcg ccacatagca gaactttaaa agtgctcatc attggaaaac gttcttcggg 3900
gcgaaaactc tcaaggatct taccgctgtt gagatccagt tcgatgtaac ccactcgtgc 3960
acccaactga tcttcagcat ctttttacttt caccagcgtt tctgggtgag caaaaacagg 4020
aaggcaaaat gccgcaaaaa agggaataag ggcgacacgg aaatgttgaa tactcatact 4080
cttcctttt caatattatt gaagcattta tcaggttat tgtctcatga gcggatacat 4140
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 4200
gccac                                                            4205
```